

# The Iron Age

A CHILTON

PUBLICATION

SEP 18 1953

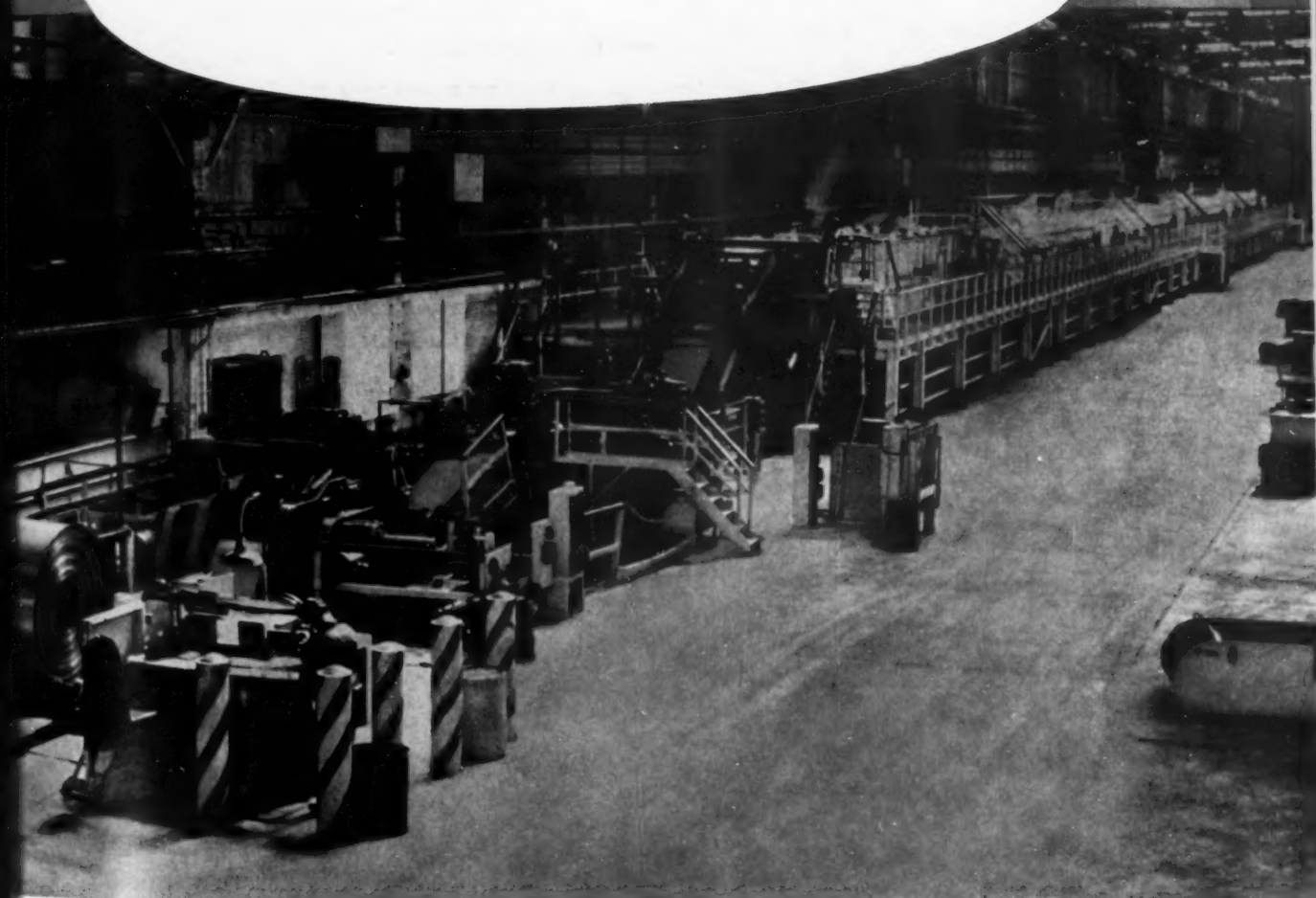
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NATIONAL METALWORKING WEEKLY

September 17, 1953

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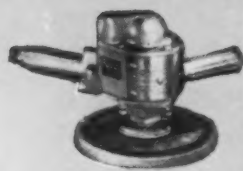
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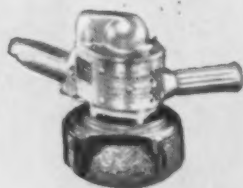
**SCALING HAMMERS**



**CHIPPERS**



**DIE GRINDERS**



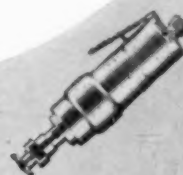
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**MIDGET DRILLS**



**RAMMERS**



**MIDGET GRINDERS**



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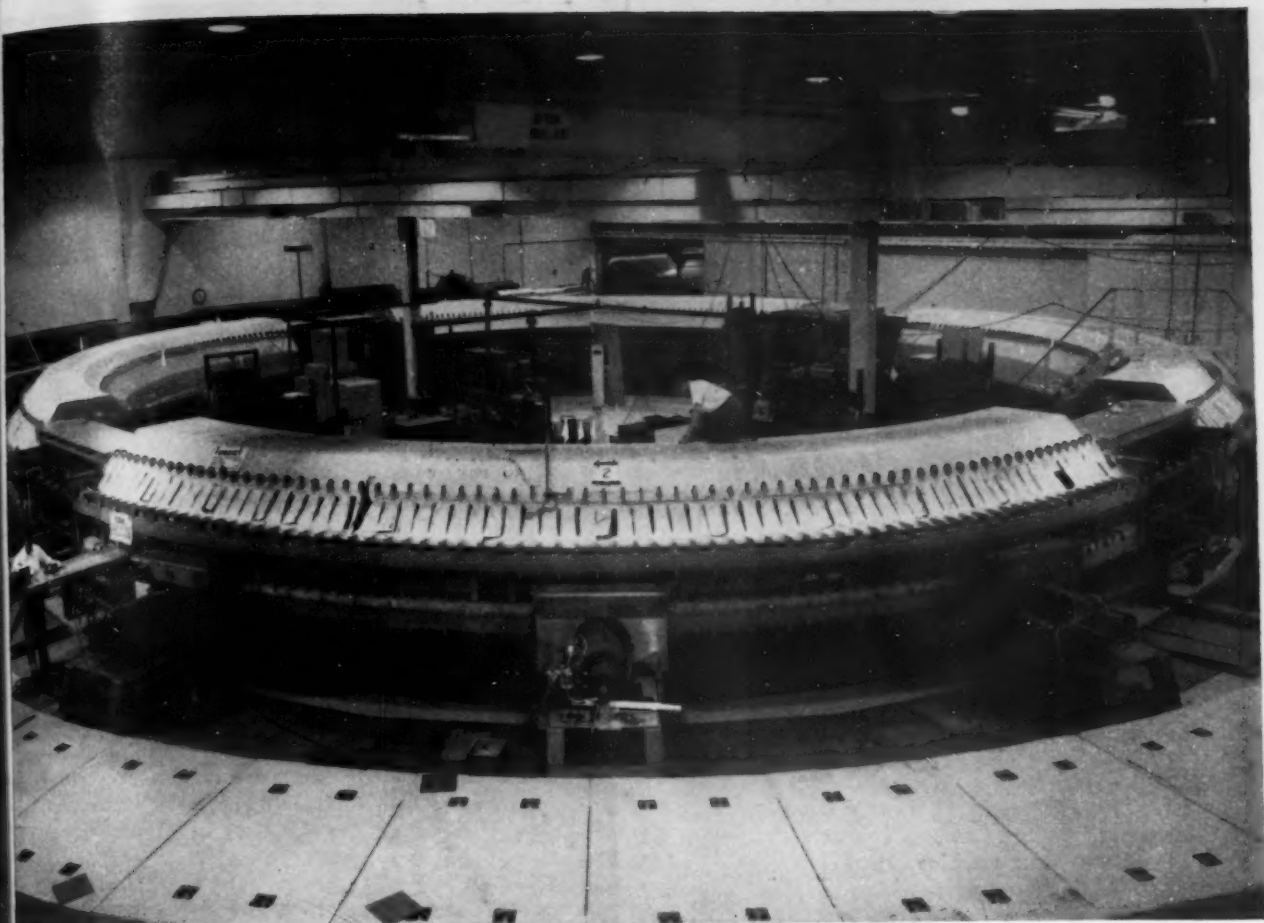
AIR •

THE **ROTOR TOOL** CO.  
CLEVELAND, OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS

HIGH  
CYCLE





One of principal elements in Cosmotron is huge magnet, consisting of 288 octagonal blocks, flame-cut and welded by Bethlehem. Wall in foreground, made up of concrete blocks, protects personnel from high-energy nuclear particles when machine is in operation.

## Welded Steel Blocks Used in Building Largest Atom Accelerator

UNIV. OF MICHIGAN  
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This is the world's largest atom accelerator. It is called the Cosmotron, and it is located at the Atomic Energy Commission's Brookhaven National Laboratory, at Upton, N. Y.

The Cosmotron makes available bombarding particles of hydrogen with an energy of from 2 to 3 billion electron volts, to create new particles known to science as mesons.

An important component of the Cosmotron is the huge electromagnet, about 75 ft in outside diameter, and weighing 2200 tons. It is designed to whirl the atomic particles around its periphery about 3 million times a second.

The magnet is a circular assembly consisting of 288 octagonal blocks. These blocks are made up of 12 octagonal plates, each  $\frac{1}{2}$  in. thick, and separated by insulating fibre. In rectangular slots, flame-cut in these plates, rests the vacuum chamber through which the atomic particles are whirled.

The blocks were made in Bethlehem's Weldments Shop, at Bethlehem, Pa., and shipped to Brookhaven, where Bethlehem engineers assembled them to form the complete magnet.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



Octagonal block for Cosmotron undergoing inspection in Bethlehem's Weldments Shop.



### BETHLEHEM WELDMENTS

# The Iron Age

Vol. 172, No. 12, September 17, 1953

\*Starred items are digested at the right.

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Address mail to 100 E. 42 St., N. Y. 17, N. Y.

# DIGEST of the

## NEWS DEVELOPMENTS

### STEEL IS WARY ON FREIGHT ABSORPTION — P. 95

As the steel market turns more competitive and consumers more anxious to trim freight costs, the steel industry must weigh the problem of freight absorption. A few mills are equalizing freight now; most avoid it. Clarification from Washington on this problem is awaited. Higher freight considered.

### NEED FOR MORE GRAIN STORAGE BINS GROWS—P. 101

Washington is working both sides of the street in its hunt for more storage space for huge grain surpluses. Inducements range from bin-building loans to farmers to storage guarantees, tax writeoffs to commercial elevators. Needs are for space in excess of 100 million bushels. Orders for 15,000 bins were just a start.

### CAPITOL CONFIDENT, READY ON ECONOMY—P. 103

When The Iron Age took the pulse beat of Washington opinion on the state of the economy, it could find no strongly dissenting opinion to the belief that all was well. Behind the scenes you can detect White House preparation for trouble if it comes. Some Congressmen are already worrying about unemployment.

### RECORD INDUSTRY BUILDING THIS YEAR — P. 106

America's productive plant will spend almost \$28 billion in 1953, surpassing record 1952 by 5 pct. About \$14.4 billion will be spent in the last half. Some decline is expected in the fourth quarter, extending into 1954. Steel industry will spend more this year than last. Post-war expansion rate listed.

### WEST EUROPE'S WIDE STRIP CAPACITY SOARS—P. 107

U. S. steelmakers and manufacturers may be faced with the double threat of decreasing European demand for flat steel products and stiffer competition in other markets as a result of climbing European wide strip capacity. This rolling capacity is expected to go up 10 million tons in the next 3 years.

### AUTOMAKERS READYING NEW FALL MODELS—P. 112

With a sensitive finger on the sales pulse, automakers are starting the annual fall ceremony of introducing new models. General Motors is planning substantial restyling of its top lines, while several producers are introducing new, higher-powered engines. A definite important trend is more models of the same car.

# of the Week in Metalworking

## ENGINEERING & PRODUCTION

### **CARBON STEEL REPLACES ALLOY FOR BOLTS—P. 153**

Hardenability is important when replacing a highly alloyed steel with a leaner alloy or carbon steel. Small-diameter coarse-thread bolts previously made of a molybdenum alloy can be made of C-1040 steel without sacrificing strength. Better heat treating is the controlling factor.

### **AUTOMATIC FEEDING SPEEDS MACHINING JOB—P. 157**

Automatic hopper and magazine feeds cut handling and speed machining operations on cast iron guide valve bushings for Buicks. Centerless grinders, with automatic feed hopper and advance, remove 0.065 in. of metal from the outside diameter of 18,000 bushings in 8 hr.

### **ADHESIVES BOND FIBROUS GLASS TO METAL—P. 160**

Adhesives offer many advantages in fastening pads of fibrous glass to metal. Pads do not mat or sag. No expensive tools are needed for application. It may be brushed, sprayed or roller coated. Metal surfaces need not be pierced or marred, yet the bond is firm and permanent.

### **SAFETY BUILT INTO ACID PUMPING SYSTEM—P. 164**

Sulfuric acid, used at the rate of 50 to 100 tons per week for pickling steel and brass, is received and stored in tanks dispersed over a large area. To handle this volume, special safety features have been incorporated into the feed lines. To cut costs, plain carbon steel was used for tanks.

### **TITANIUM ANALYZED WITH SPECTROGRAPH — P. 166**

Used successfully for beryllium, zirconium and uranium, the emission spectrograph now meets the analytical requirements for titanium. Analysis is flexible, precise and fast. Accurate standard samples can be made by the fusion technique. Solid samples are satisfactory for production control.

### **NEXT WEEK—BETTER TUMBLING CUTS FINISHING COST**

Improved tumbling methods have reduced burring and bench finishing costs. Success is due largely to integration with other manufacturing operations. An exacting combination of granite chips, abrasives and compounds are used for each job. Close timing and cleanliness account for additional savings.

## MARKETS & PRICES

### **REFRACTORY BUSINESS SETTING HOT PACE — P. 96**

Producers of refractories expect business this year to top 1952, but it won't pass record peak reached in 1951. Uninterrupted steel production was the paramount factor in the sales increase. But prospects are for good profits in '54 despite the dipping steel rate. Answer lies in big capacity increase.

### **FORGING INDUSTRY BOOM QUIETS DOWN — P. 97**

After a booming first half, the nation's forgers are finding their business in a slump. Shipments are slipping and industry estimates on the drop from first half levels range from 10 to 30 pct. But '53 will be a good year as shop owners term the dip a return to "normal business levels." Volume's okay.

### **NONFERROUS SUPPLIES UP, DEMAND DOWN — P. 98**

Metal markets range from soft to easing except for nickel. Copper is plentiful and prices are likely to head downward. Chilean situation keeps the trade jumpy. Aluminum is easing but accelerated stockpiling may slow the process. Industry awaits outcome of Alcoa suit. Nickel situation still rough.

### **1954 TOUGHER FOR MILL EQUIPMENT MAKERS—P. 123**

End of steel industry expansion signals year of more intense competition for mill equipment manufacturers. Most builders report '53 business below last year's level but say it will still be a good year. Backlogs are dropping rapidly. Competition expected to keep steel mill equipment prices from rising.

### **STEEL UNWORRIED OVER INGOT RATE DROP — P. 197**

Steel people generally are not worried about the ingot rate which last week fell to its lowest point in 13 months. A holiday and a strike were factors in the decline. But steel officials have been predicting a "moderate" decline in business for several months; word has gone out to salesmen to increase selling efforts.

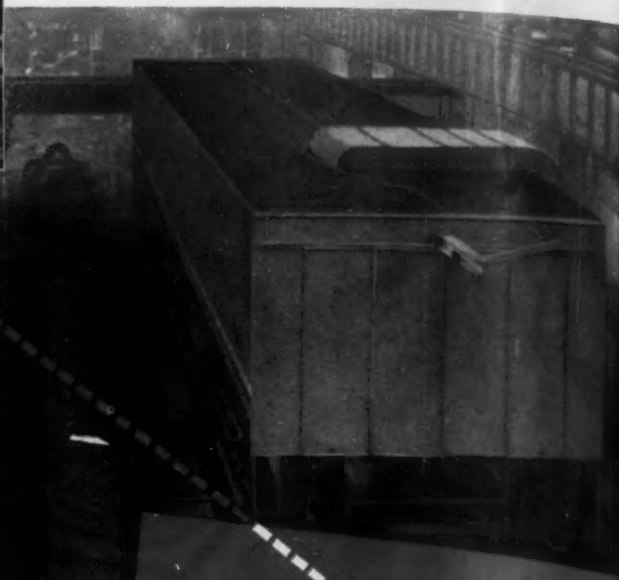
### **IMPORT FIRM INTERVENES IN ALCOA SUIT — P. 200**

Aluminum Import Corp., U. S. sales agent for Alcan, has intervened in the Justice Dept. suit against Alcoa. The company has plenty at stake, needing the long-term contracts to aid financing of huge Kiimat smelter. Third round decision waits results of case. Zinc price dipped  $\frac{1}{2}\epsilon$  to  $10\frac{1}{2}\epsilon$  at New York.





From the batch type installation at the left martempering base detonator fuses, to the huge mechanized furnaces austempering automobile bumpers illustrated below, Ajax Electric Salt Bath Furnaces are replacing old-style quench and temper methods for a wide variety of steel products.



From ring gears to plow points . . .  
From bearing races to cast iron cylinder sleeves . . .  
From uniformly shaped metal parts to odd and irregular sizes . . .

Scores of installations have proved the tremendous possibilities for economy, greater speed and efficiency in martempering and austempering, because all water and oil quenches are eliminated.

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Write for Ajax Bulletin 120

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## Editorial

*The Iron Age*

FOUNDED 1855

# Thanks To A Million Frank Baileys

**F**RANK BAILEY retired a few months back. Chances are you never knew Frank. If you were a customer of a well known steel firm you may have remembered his signature.

For more than 35 years Frank's name on test reports assured you that your steel was okay. The best speech at Frank's party was made by him. It was not too long—and it was surprisingly simple and heartwarming.

He did not talk much about his job. He spent his time talking about people—those who had worked for him. He enjoyed their confidence and in his way he loved them.

Frank thanked all his people for their cooperation during his long service as test supervisor. You might ask, "Was Frank a success?" There is only one answer: Yes, but you have to know the Frank Baileys to know why.

The Baileys don't operate like the books say—nor do they read these books. They do a good day's work and they work with a personal attachment to their men.

The Frank Baileys we know never wanted to be president. They played no politics and they were devoid of bitterness. Their workers' doings, families, aspirations and success were meat and potatoes to Frank and his counterparts.

When one of his boys moved up and on Frank was as happy as if it were he. If the top dog was on the rampage Frank absorbed it—and talked softly to his men.

If the customer blew the roof to the city office Frank remembered customers who blew it higher. But Frank never shirked his duty. He told off his workers if they let him down but the way he did it made it unnecessary soon to do it again.

Frank's job was important. He took it seriously. But he never took himself so seriously that he acted out of character.

There are millions of Frank Baileys. They do the same job day in and day out. They ask for no praise. Their reward is in a job well done and in knowing that men have souls which must be fed from time to time with understanding.

Without the Frank Baileys business would be at a standstill. They know there isn't room at the top for everyone. The Lord bless and keep them.

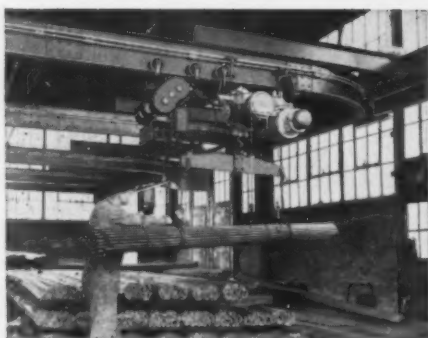
*Tom Campbell*

Editor

# MONORAIL *Pays!*

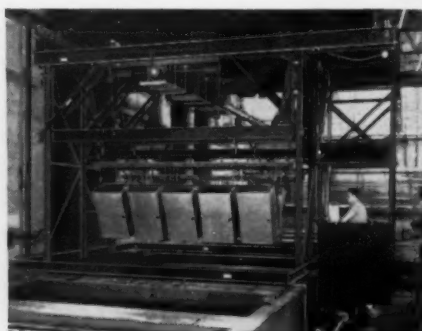
## INCREASES TONNAGE

From 26 to 48 tons of steel rod per day was the increased movement produced by a properly engineered monorail system.



## LOWERS COST

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# Dear Editor:

## Letters from readers

### A Foreman Speaks Out

Sir:

I enjoyed your editorial "A Foreman Speaks Out" in your August 13th issue. It contains good, sound advice for members of management. Would you be good enough to send me 20 copies of this article so that I can distribute them to my foremen?

C. M. SCHMID  
General Factory Supervisor

Reese Padlock Co.  
Lancaster, Pa.

A few reprints are still available.—Ed.

### Synthetic Resins

Sir:

In the September 3rd issue, on the Newsfront page, reference is made to new synthetic resins. Could you please tell us the company who will be offering these materials?

C. M. TAYLOR  
Steel Ingot Production, Inc.  
New York, N. Y.

The Goodyear Rubber & Tire Co., Inc., Films Foam Flooring Div., 292 Madison Ave., New York, N. Y. can give you further information about where these resins may be obtained.—Ed.

### Soldering Iron

Sir:

PLEASE WIRE ADDRESS OF THE PAUL C. ROCHE CO. ARTICLE, "SOLDERING IRONS HAVE LIFE-TIME HEATING ELEMENTS" IN AUGUST 6 ISSUE, P. 112.

B. ALBERTS  
National Research Bureau, Inc.  
Chicago, Ill.

The company's address is 11 Park Place, New York 7, N. Y.—Ed.

### New Polishing Machine

Sir:

Would you be so kind as to provide me with an address through which I can contact Mr. Herbert Chase who authored the article "New Machine Polishes Zinc Diecast Parts Automatically," published in your August 20th issue?

This is a very interesting article and covers a process we would like to investigate further. Your assistance would be greatly appreciated.

L. W. PAYNE  
Vice President, Production  
Kilgore, Inc.  
Westerville, Ohio

Mr. Chase lives at 110-34 71st Road, Forest Hills 75, N. Y.—Ed.

### Information on Steel

Sir:

Please send me your "Handbook of Terms" and your "Directory of Steel and Nonferrous Specifications." Also, I would be very interested in receiving any literature concerning stainless steels and high temperature alloys used in the making of jet engines or knowing where such information may be found.

RICHARD MYERS  
Metallographer

Buick Motor Division  
Willow Springs, Ill.

The Iron Age has published five articles on this subject this year. More information may be found at the John Crerar Public Library, 86 E. Randolph St., Chicago 1, Ill.—Ed.

### Nuclear Power

Sir:

In the August 20th issue, there is an article entitled "New Tests Prove Materials for Nuclear Power Plants" by Robert F. Koenig, pages 129 to 133. Because of its interest, we would very much appreciate receiving your permission to reprint this for distribution to our members only. Proper credit would, of course, be given.

J. R. DERRICKSON  
Executive Secretary  
Formed Steel Tube Institute  
Cleveland, Ohio

### Tube Expanding Machine

Sir:

We are referring to the article in your August 27th issue on verticle tube expanding machines, manufactured by the Walter P. Hill Co.

Will you please advise us the address of this manufacturer in order that we may write them for further information?

F. E. PRICE  
Manager  
Price Fireplace Heater & Tank Div.  
Buffalo, N. Y.

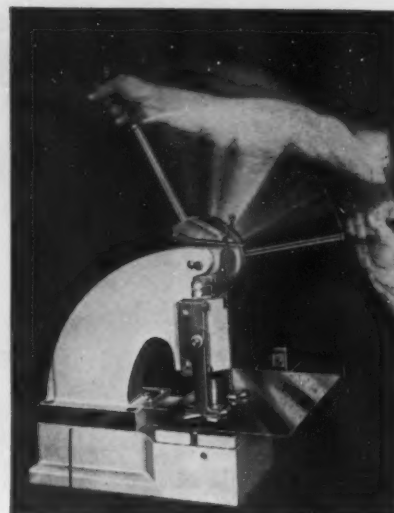
This company is located at 22183 Telegraph Road, Detroit 19, Mich.—Ed.

### Financial Analysis

Sir:

We are interested in obtaining a copy of "The Iron Age Financial Analysis of the Steel Industry," 1952-1951 which was published in your April 9th issue.

E. J. HOCKSTAD  
Financial Vice President  
LaSalle Steel Co.  
Chicago, Ill.



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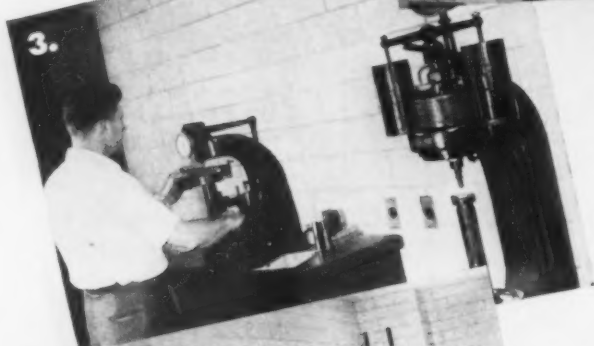
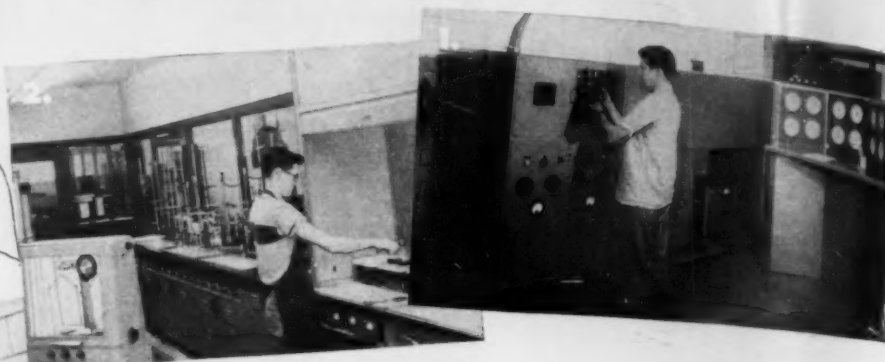


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# Final exams for Finkl's Forgings and Die Blocks



From steel formula to finished product, Finkl die blocks and forgings are carefully checked. Analyzed spectroscopically and chemically, tested with Rockwell and Brinnell, and thoroughly inspected by Ultrasonic and Magnaflux methods, Finkl forgings and die blocks are the finest available and at the lowest cost to you.

These tests are run under the keen metallurgical eye of Ted and his crew of technicians, John, Clay, Oscar, and Kenny, assuring you that your forgings and die blocks have passed the most critical modern tests by experts in their field.

Since 1879, "Forgings by Finkl" and die blocks with "Impressions That Last" have been products of the highest quality. When planning your die block or forging requirements, you are invited to call on Finkl's experienced men and modern facilities.

1. Spectroscopic test
2. Chemical test
3. Hardness test
4. Tensile test
5. Ultrasonic test
6. Magnaflux test



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FORGINGS • DIE BLOCKS • ELECTRIC FURNACE STEELS

# Fatigue Cracks

by William M. Coffey

## Inside the Iron Age (V)

Want to tell you just a little bit about Charlie Lippold, our alert Sales Manager. Charles is a pretty tall fellow, around 6' 6", and being on the shorter side ourselves we once asked him how it felt to breathe the thin atmosphere. The Lippold said it was fine, but his hardest problem was not to offend shorter people by making it obvious he had to bend down to talk to them.

He doesn't want to give us lesser people a complex, so over the years he's developed a sort of graceful twisting and bowing technique that seems to solve the problem. Charlie has long been used to his exalted position, and as far as we know was flustered just once.

Emerging from the upper level hole of Grand Central Station, with head tilted slightly forward so as to miss the roof and not to miss any of his shorty friends, he was brought up with a jolt to suddenly find himself swimming in a sea of people, all of whom were a head or so taller.

Staggered, he recalled the bad ice he had the night before. He didn't recover until he weakly asked a porter, "What gives?" "Why, suh, they is all members of the tall people's club." Charlie recovers more quickly than most, but for 3 days he sulked. Couldn't get a thing out of him.

To throw a little more light on the type of fellow this Lippold is, he had the gout a few weeks ago. We never heard of that kind of a thing since Henry VIII, but Charlie had it all right. Seems its pretty painful stuff and you can't get the gouted foot into your regular shoe. So Charlie came to the office wearing one nicely turned oxford and one slightly worn sneaker.

Asked why he didn't even things up with two sneakers, making at lease for a neater appearance, he said that this way people say, "poor fellow, got something wrong with his foot." Wearing two sneakers they'd say, "the dope, got something wrong with his head."

Although battling the gout, and too short to join the tall people's club, Charlie still manages to run a sales department that over the years has produced more advertising pages than any other magazine in the world. That's THE IRON AGE.

## Inside the Iron Age (VI)

... thought we were through with the Charlie? Nonsense. Here's

another saga that reveals more about the boy. We have a friend, Professor O'Cobhthaidh, late of the USN. A few years he commanded an American Battleship, 30,000 odd tons of big fighting ship.

We asked him once, "isn't it a big worry bringing a huge ship like that into a crowded harbor like New York where each day 200 or more ships are going in or out criss-crossed with a thousand ferries, fishing boats and china closets cluttering up the channel?" "Not a bit," he answered. "Just put a good quartermaster at the wheel, watch your buoys and let her go. It's amazing how everything gets out of your way." That's the way Charlie goes through a crowd. Good ole Charlie.

## A Poem

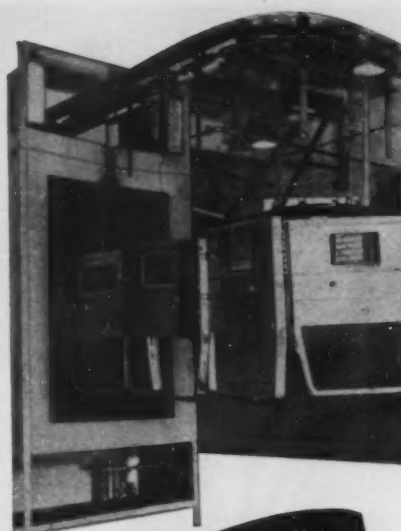
*I think that I shall never see  
A hazard rougher than a tree—  
A tree o'er which my ball must fly  
If on the green it is to lie;  
A tree which stands that green to guard,  
And makes the shot extremely hard;  
A tree whose leafy arms extend  
To kill the mashie shot I send;  
A tree that stands in silence there  
While angry golfers rave and swear.  
Niblicks were made for fools like me,  
Who cannot even miss a tree.  
—Anonymous  
(After Kilmer)*

## Puzzlers

In the case of the young man who had a girl in Brooklyn and one in the Bronx, calls on them depending on how the trains run from Manhattan, the trains for the Bronx leave one minute after the Brooklyn trains. That is, there is a nine-minute wait for a Brooklyn train followed by a one-minute wait for a Bronx train.

## New Puzzler

A commander of a body of troops wished to transport all his men across a stream with the same number of men in each boatload. He found that if they went over 2 at a time one would be left for the last load; if 3 at a time, 2 would be left; if 4, then 3 would be left; if 5, then 4; if 6, then 5; if 7, then 6; if 8, then 7; if 9, then 8; if 10, then 9. But if 11 men were in each boat, none would be left over. How many men were to cross the stream?



**METALWASH  
AT AUTOCAR**

Illustration shows cab doors for Autocar trucks being cleaned, phosphate coated, and dried.

This METALWASH phosphate coating machine provides an ideal surface for a lasting paint finish on truck chassis and sheet metal parts.

Cleaning and phosphating are uniform since the cycle is automatically controlled. Continuous operation, built around the conveyor line, eliminates material handling problems.

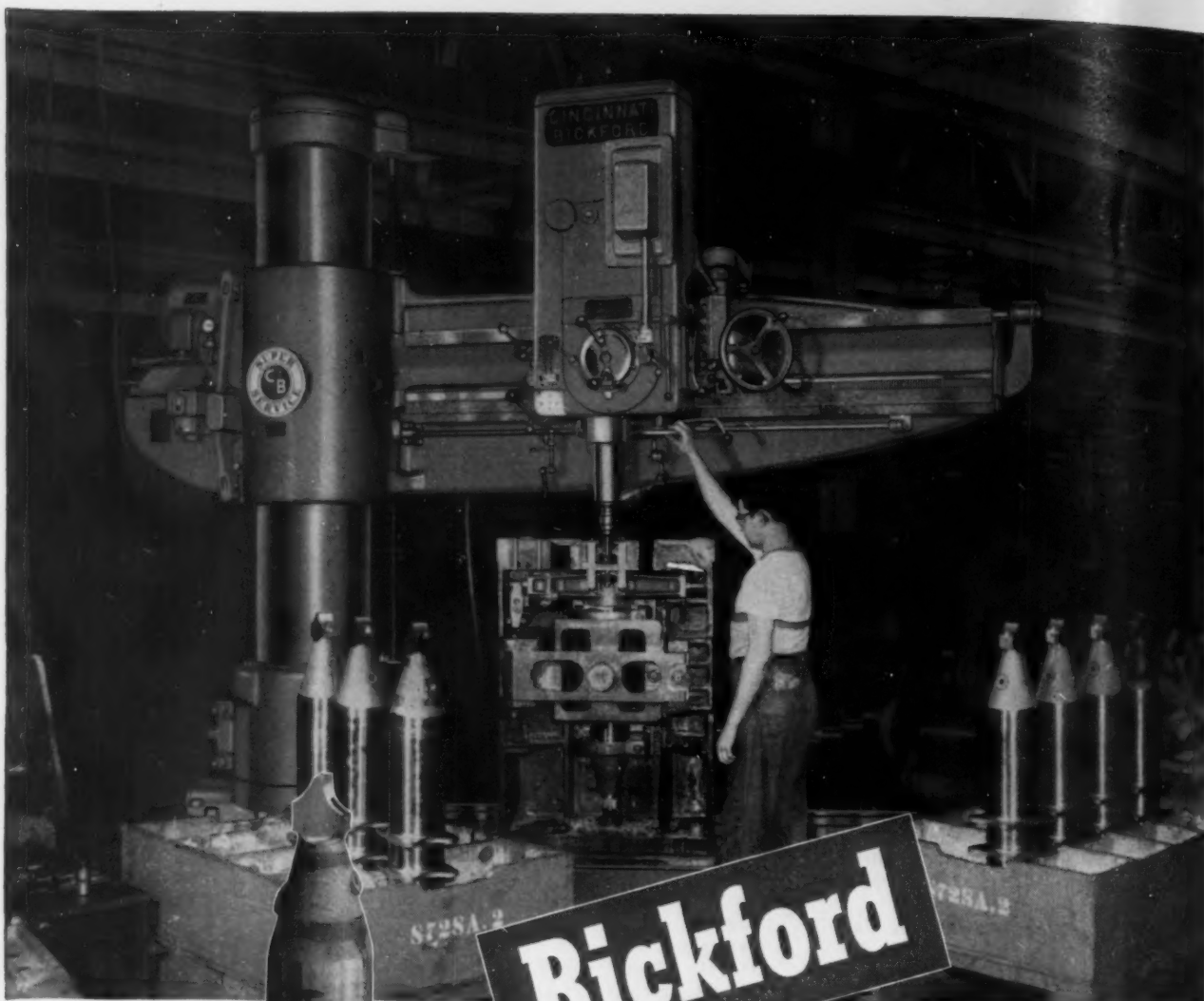
*Metalwash Finishing Engineer, published quarterly, is available on request to engineers and executives to whom cleaning and finishing are operations of interest.*

*Write on your company letterhead for your free copy.*

**METALWASH**  
MACHINERY CORPORATION

920 North Ave., Elizabeth 4, N. J.  
Representatives in principal cities





Photos courtesy—  
The Cleveland Pneumatic  
Tool Company, Cleve-  
land, Ohio.

# Bickford

gives complete satisfaction...

The convenient centralized controls, the wide range of speeds and feeds, and the high visibility head of this Cincinnati Bickford Radial Drill are all contributing to fine performance on this job.

The Cleveland Pneumatic Tool Company say "Performance and ease of handling are all that could be desired."

On this cylinder for an aircraft nose type landing gear, drilling, reaming and spot facing operations are being done.

Cincinnati Super Service Radial Drills are accurate, powerful and profitable in the shop.

Write for Bulletin R-29.

CINCINNATI  
BICKFORD



RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

## THE IRON AGE Newsfront

STEEL WAREHOUSES ARE FOLLOWING INDUSTRY to locations outside big industrial communities. Proof: At least 50 pct of new steel warehouses were built in areas where none or only one existed before. Warehouse operators have also been Johnny-on-the-spot with new Southern customers.

ALMOST READY FOR MARKETING is a new type electric arcwelding machine. It's portable and automatic, feeds standard cut electrodes from a hopper. Initial commercial tests in the U. S. and Canada are reported successful.

A SIMPLE ACCURATE WAY TO GAGE removal of metal to the last few tenths without stopping the machine or removing the part has been developed. A movement of fifty millionths (0.000050) in. can be read by the operator on a column-type air gage.

A WHOLE NEW SERIES OF SINTERED METAL PRODUCTS may stem from studies being conducted by a governmental research team. Success could mean sharp improvement in high temperature strength properties of relatively pure metals, savings in alloying elements.

IMPROVEMENT IN STEEL SUPPLIES has sparked a speedup in building of British locomotives, rolling stock. British feel this will better their competitive position in world markets. They especially want South American business.

BRITISH AIRCRAFT ENGINEERS appear to be thinking more along lines favored by U. S. designers. That is, toward turboprops rather than straight jets for commercial airliners for longer range and greater fuel economy. Turboprops rated at 4150 hp have been installed on the Bristol Britannia.

NICKEL-CADMIUM AIRCRAFT BATTERIES made in France are being installed in some Navy planes. They cost three times as much as lead-acid batteries, have a noncorrosive electrolyte, are said to have 90 pct more ampere-hour capacity. Some 2000, sealed in stainless steel, are on Navy order.

NORMALIZING IN A PROTECTIVE ATMOSPHERE under a new setup which assures complete control of carbon has made tubing, especially aircraft grades, available without surface decarburization. Special furnace features handle carbon restoration, annealing and normalizing.

NEW EMPHASIS ON QUALITY WILL KEYNOTE the 1954 automotive lines. Some automakers blame disappointing sales on cost cutting at the expense of quality. This refers to superficial features such as upholstery, trim and finish which will be spruced up for the tough competition to come.

REFRACTORIES OUTLOOK FOR THE FOURTH QUARTER is generally good. Many firms report sales during the first seven months of 1953 are running ahead of volume for the first half of '52. Backlogs have been reduced and most firms can now schedule deliveries on a normal basis.



**WORTH MORE OF YOUR TIME!**

# Specification Analysis can be profitable!

Manufacturing processes are sometimes built around standard steel specifications in the mistaken belief that there are no alternatives. For example, some manufacturers grind cold rolled strip steel or the fabricated part to secure close gauge tolerances, while others use a trimming process to cut off "ears" on deep drawn parts. Both of these examples represent costly manufacturing operations which are often unnecessary if there is an understanding that cold rolled strip steel can be purchased to specifications which will not produce the undesirable characteristics

you seek other methods to avoid.

Time spent with our specification engineers in reviewing your specifications for various types of cold rolled strip steel may develop recommendations for changes in your specifications which will have the effect of lowering your end product cost. "Specification Analysis" can be profitable. May we review your strip steel specifications and interpret them in terms of what CMP precision strip steel made specifically for your requirement can do for you?



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# STEEL: Gun Shy on Freight Absorption

**As competition looms, steel's interest stirs . . . Major plants now avoid it, want Congress to rule on muddled picture . . . Rail increases curb freight equalizing—By J. B. Delaney.**

Freight absorption has become a subject of more than academic interest to steel producers as softening markets herald a return to actively competitive conditions in the industry. (See p. 117 for Washington developments.)

A few companies already are absorbing freight charges to compete with mills closer to their customers. Products affected include merchant wire products, stainless steel, and, to a lesser degree, mechanical tubing.

Major producers are taking a dim view of substantial freight absorption just now. But the picture could change overnight should freight charges become a factor in sale of tonnage items.

## Steelmakers Gun Shy

What little freight absorption is going on is being done cautiously by independent mills. Usual procedure is for the district office of a producer to certify that to remain competitive in a given area a certain price must be met. The producer then decides whether he wants to compete in that market or withdraw. It's done on an individual basis.

Federal Trade Commission has said there is nothing wrong with meeting competition in this way. But steel companies are still gun shy. They would feel better if Congress would pass one of the proposed bills to permit absorption of freight on an individual basis. Both FTC and the Dept. of Justice have indicated they would accept legislation of this type.

Steel mills have sold on an f.o.b. mill basis since July 1948 following the famous cement case which outlawed basing point pricing.

Since then, business has been so good, except in early summer of 1949, that consumers have been more than willing to pay freight charges from distant mills to get steel.

Now that supply has eased considerably, will ease further, steel users are becoming more independent, are paring costs wherever possible. Freight will be an increasingly vulnerable target. Congressional committees say their mail indicates more acute interest in pending legislation on freight absorption. Pressure for passage at next session is expected to

Pittsburgh and New York rose from \$7.20 per ton to approximately \$14.20 per ton.

One saving feature is a special 80,000 lb minimum rate installed by the railroads May 1, 1950 to meet competition of trucking companies. For shipments of this size, the rate between Pittsburgh and Detroit is \$8.04 a ton, and between Pittsburgh and New York about \$11.40 per ton.

## Reshuffling of Business

Some producers have already decided how much freight they will absorb to retain their position in various marketing areas. Beyond that, they feel, lies economic suicide. Some mills now are giving up business rather than pay all or part of freight charges.

## How Freight Costs Have Risen

Basis 40,000 Lb Minimum

Before June 30, 1946, you could ship a ton of steel for.....	Pittsburgh to Detroit \$ 5.80	Pittsburgh to New York \$ 7.20
Now it costs you about.....	\$11.73	\$14.20

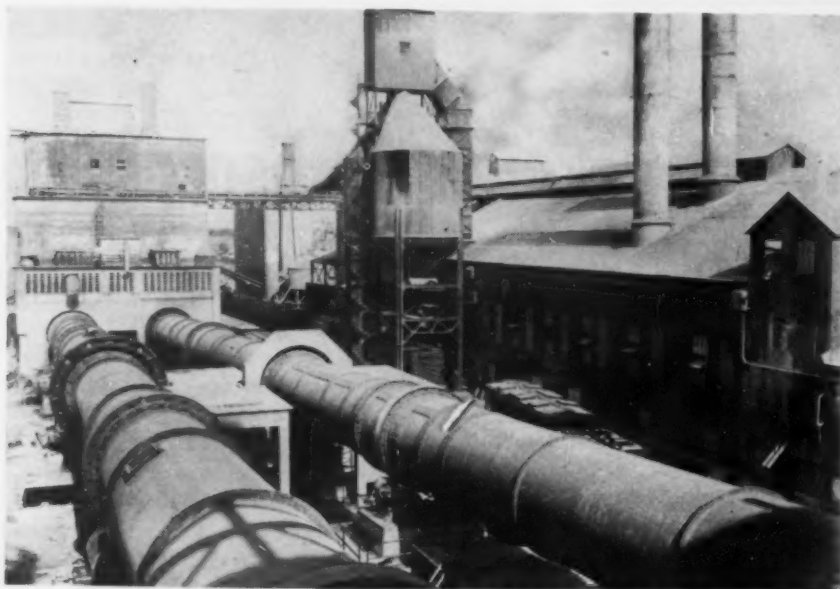
mount late this year and into 1954.

Increases in railroad freight rates since 1946 will tend to restrain steel companies from reaching far beyond their normal marketing areas to get business. At least, present high cost of transportation will impose a stiff premium on competition in distant markets.

For example, before June 30, 1946 a Pittsburgh steel producer could ship into the Detroit market by rail for \$5.80 a ton. Today the same 40,000 lb minimum rate is about \$11.73 a ton. During the same period, the rate between

There has already been some reshuffling of business, especially by consumers who were forced to buy from remote sources during the peak of the steel shortage. Tendency of these consumers now is to place orders with mills closer to home.

Unless the steel ingot rate goes into a real tailspin, freight absorption is not likely to become as widespread as it was prior to 1948. The mills want as little of it as possible. Big producers particularly intend to hold the line and will equalize freight only if forced into it.



VIEW SHOWS 330-ft rotary kilns at Basic Refractories' Ohio dolomite plant.

## REFRACTORIES: Setting Hot Pace

**Business this year expected to top '52, but it won't top record peak reached in 1951 . . . Predictions based on expectation of "moderate" steel decline—By R. M. Lorz.**

Refractories are banking on steel tonnage and renewal orders as they move into the fourth quarter and look ahead to 1954. Even though most producers reported new construction at a standstill, first half shipments generally were up about 15 pct over those in 1952.

Uninterrupted steel production has been the paramount factor in the sales increase. Producers optimistic about prospects for 1954 say they will operate profitably even if there is a moderate percentage drop in steel operating rates. Key to their optimism is increased capacity. In discussing this topic most refractories executives claim their primary interest is in tonnage. If it stays relatively high they are bound to have a good year.

### Trimming Inventories

Despite the general air of optimism in the industry, sales managers don't expect business to fall into their laps in '54. They are concentrating on better compositions and cost cutting. Consumer inventories have melted consider-

ably since last fall and mill buyers are no longer ordering in advance of actual needs. Transition to a buyers' market got under way this year after the threat of a refractories strike evaporated.

Market outlook for the coming year is bolstered considerably by prospects for healthy demand from industries closely allied to steel. Silica brick sales should be very good. Although coke oven construction has passed its peak, a monumental rebuilding job seems to be shaping up. Some authorities estimate there are at least 5000 coke ovens now operating which are over 30 years old. Rebuilding these ovens will take a lot of silica brick. Increasing popularity of electric furnaces should also help silica sales.

New compositions and applications have kept basic refractories in the race. Dolomite "guns" for spraying linings in open hearths and foundry cupolas highlight the streamlined trend. At the moment the largest producers of dead burned dolomite and other basic refractories are going all out to

make a better, cheaper product.

Refractories firms will also have to find ways to trim operating costs. Recent price hikes have generally counterbalanced across the board wage increases, but mounting materials costs are still a problem. One of the largest producers of fire clay brick estimates that its natural gas costs have risen 74 pct within the past 4 years. Higher freight bills are also a headache.

### Steel Takes 65 to 70 Pct

Expansion in the industry (an estimated 35 to 40 pct within the past 6 years) is promoting more efficient operation. Growth has been terrific ever since NPA cleared the way for rapid amortization in 1951. The command performance is just about over now. With many firms operating at about 80 pct of capacity, rumors of overexpansion are heard. But refractories producers aren't worried. New capacity should give them a chance to operate more efficiently while they effect tax savings and retire outmoded facilities.

Although steel mills consume an estimated 65 to 70 pct of total refractories output, market developments in other fields aren't being slighted. Demand from glass, ceramic, oil, chemical, and cement industries continues to be good. Specialty producers figure prominently in these markets. Many will be watching the cement industry next year.

### "Normal" Isn't Bad

Researchers too are making valuable contributions to future market development. They report that use of castables and plastics is becoming more common. Applications range from water cooled boiler settings to atomic energy plants.

All factors add up to a good business year for refractories in 1953. Most authorities say it will be better than '52. While they don't expect shipments to top the record peak reached in 1951, producers aren't disappointed.

## FORGINGS: The Boom Quiets Down

First half surge in forging industry is over . . . Current shipments are down 10 to 30 pct . . . Industry not alarmed, still sees '53 as a good year—By K. W. Bennett.

After a booming first half, the nation's forgers are finding their business in a slump. Shipments of forged components are slipping and industry estimates on the drop from first-half levels range from 10 to 30 pct.

There is no cause for alarm, however. Despite the current slip, 1953 is expected to be a good year for forged products. Most shop owners refer to the decline as "a return to normal business levels" and term volume "satisfactory."

### Cut Inventories

Main concern is the fact that the downward movement is more or less across the board. Heavy specialized forgings continue in strong demand, but orders for both standard heavy forgings and light forgings are off.

One reason for the decrease in orders is that some consumers have found their inventories are too high. Cutbacks by the farm equipment industry were first felt in June and by July there was also a dip in purchases by automotive and appliance producers.

These trends appear to be strengthening and little change is expected during the fourth quarter. Some industry sources believe volume will pick up next spring.

### Strong Aircraft Demand

The current year started off badly for the forging industry. Defense business was already sickly and civilian demand, particularly in the Midwest, wasn't taking up the slack. By the end of February, however, business volume rose to near record levels and stayed that way through most of June, and in many cases, July.

Heavy forgings of special types continue to enjoy booming demand as do aluminum forgings for aircraft engine parts. Despite aircraft cutbacks last year, and again

early this year, aluminum forgings appear solid through November. This is true of both reciprocating and jet engine parts, though reciprocating parts were cutback more extensively than jet engines.

Producers report demand for both alloy and carbon steel forgings has dropped. Deliveries were running 6-8 weeks at the beginning of this year, but alloy forgings can now be obtained in 4 weeks. Expansion of the chemical industry has been a help here but hasn't been enough to offset sales slides up to 20 pct. Some sources report their backlogs of light and heavy forgings have been wiped out.

### Materials Ease

Improved raw materials supplies have enabled forge shops to meet the tighter delivery schedules demanded by purchasing agents. There have been some bar and even billet cancellations among smaller forge shops, and large forge shops report that steel billets are considerably easier.

Small and medium shops say their inventories are in fair to

good shape, and a few are actually reducing inventory. Some large shops still have trouble getting carbon billets in quantity but expect this problem to be over by the fourth quarter. Die steel that required nine-months' delivery last year is now available from plant inventories.

### Volume Off 20 Pct

Despite the recent drop in volume forge shops have good reason for not being too concerned. In 1947 the industry produced 1,333,731 tons of forgings, hit 2,551,135 tons in 1951, and by the third quarter of 1952 equaled the entire 1947 output.

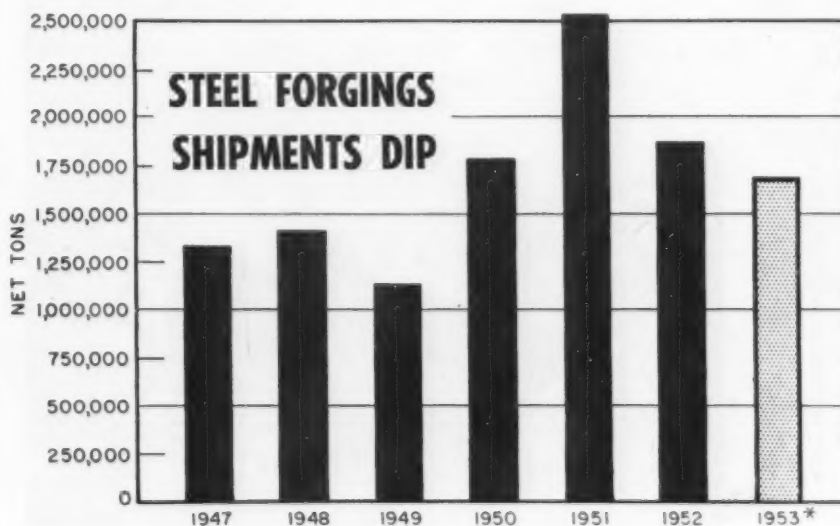
Estimates of individual producers on their output for this year range from 10 to 20 pct behind the 1952 level.

### Materials Survey on Tin Issued

Latest picture of the tin situation, together with statistics on production, consumption and stocks throughout the world, was released last week by the Office of Defense Mobilization with publication of its *Materials Survey on Tin*.

In addition to chapters on major deposits, resources, smelting and refining methods, it contains also a directory of major companies engaged in mining, smelting, and refining.

It is available (\$4.25) from the Government Printing Office.





## NONFERROUS: Supply, Prices Steady

**Most metal supplies are abundant . . . Aluminum easing but stockpiling will slow it . . . Lower copper prices seen . . . Nickel still tight, ponder decontrol—By R. L. Hatschek.**

Conditions in the major non-ferrous metals markets range from soft to easing. Supplies in all cases except nickel either match or exceed requirements and, with general industrial activity expected to dip slightly, demand for the metals should also wane slightly. On the whole, prices are relatively stable with some gradual declines expected.

**Copper . . .** Ample supplies of copper are available in the range of 29¢ to 30¢ per lb. This price is likely to ease further. Custom smelters are now paying 23¢ to 23½¢ per lb for No. 1 heavy copper and wire scrap—about equivalent to a 27¢ price for refined copper.

While this scrap price has been fluctuating somewhat in recent months, smelters have been selling at the world market price of about

29¢. Big mine producers have clung to a 30¢ per lb price. How long this will continue in the face of increasing foreign competition is questionable.

Add the factor of slackening domestic demand and the market is bound to decline. Military requirements are being trimmed, automotive use is off and a dip in appliance needs is anticipated.

The main factor which has been keeping the trade a bit jumpy is the Chilean situation. Surplus copper stocks in that country have now grown to about 100,000 tons. Despite the slipping world prices, the Chilean government has been reluctant to cut its own price of 35½¢ per lb f.o.b. Chilean ports.

U. S. industry has no use for Chilean copper at this level. Brass and copper mill prices were recently dropped to reflect the 30¢ quotation rather than the earlier

average of U. S. and Chilean prices. But for a number of diplomatic reasons, the State Dept. has offered to buy Chilean copper.

Chile is in financial trouble—which would be largely solved if the sale is made. The U. S. does not want this copper to fall into Communist hands and Chile has indicated it would sell to "anyone" if the U. S. doesn't buy. And the strategic stockpile, which was tapped heavily during the recently passed shortage, has never been replenished.

Terms of the offer were never made public but, at press time, an answer from the Chilean government was imminent.

**Aluminum . . .** Actual total civilian demand for this metal is an unknown quantity. Aluminum has found many new uses in the past few years. But many of them have never had a chance to develop as a result of severe restrictions imposed by rearmament.

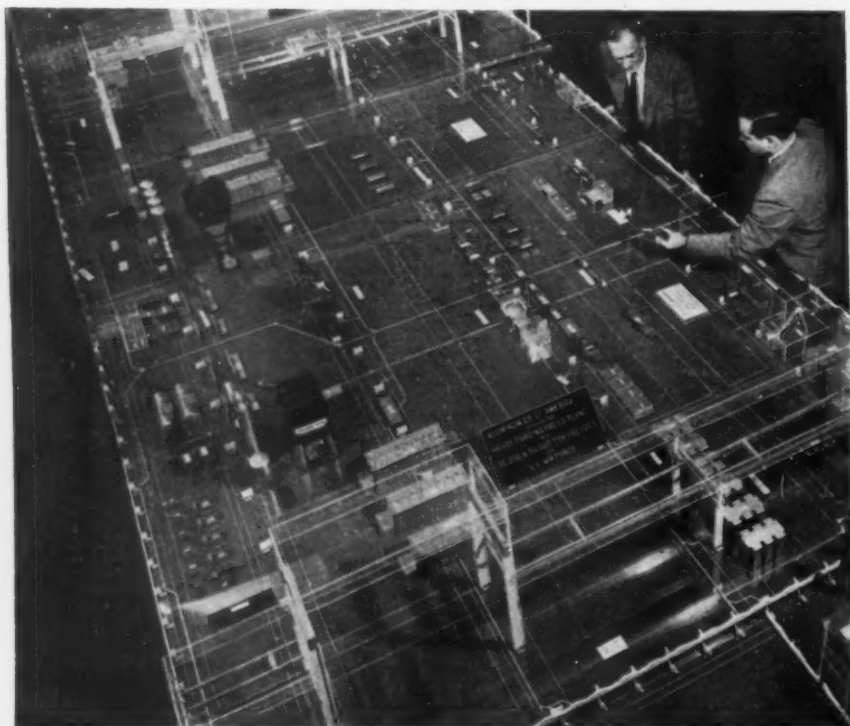
Smelting capacity has been just about doubled in 3 years and yet aluminum hasn't been plentiful enough to keep up. Severe power shortages in 1951 and 1952 also took a high toll of production schedules.

Power shortages won't be repeated this year since rainfall in the Pacific Northwest has been exceptionally heavy. Defense mobilizers anticipate total 1953 production of primary aluminum will hit 1.26 million tons. Monthly figures are climbing steadily. But record-breaking tonnages are scheduled to go into the strategic stockpile in the fourth quarter.

Considering a reduction in defense requirements, the government calculates there will be net gain of a few percent to civilian consumers. Larger imports are expected to assure this.

Producers were expecting to have to put the pressure on sales forces during the first half of 1954 but accelerated stockpiling could delay this a while. Prices are steady at the levels established in June.

Thorniest issue in light metal circles is the Justice Dept. suit against Aluminum Co. of America.



HEAVY PRESS PLANT laid out in miniature by Aluminum Co. of America. The 3-D model lets workers as well as engineers give their ideas.

## Machining

The trust busters seek to throw out a contract recently signed with the Canadian producer for 600,000 tons of pig and ingot over a period of several years (see p. 200.)

Innocent bystanders in this case, are producers who are anxious to get into the third aluminum expansion round. They desire some government financial aid in getting a start and the Administration is reluctant to go along. A final decision on this round must await a decision in the Alcoa case because of the market implications of the contract in question.

**Lead, Zinc . . .** The twin metals are showing their individuality by following opposite market trends. Last lead price change was a  $\frac{1}{2}\epsilon$  boost to 13.80¢ per lb at St. Louis while the most recent fluctuation in zinc was a  $\frac{1}{2}\epsilon$  cut to 10.00¢ per lb at East St. Louis. Demand for lead is high; for zinc it's light.

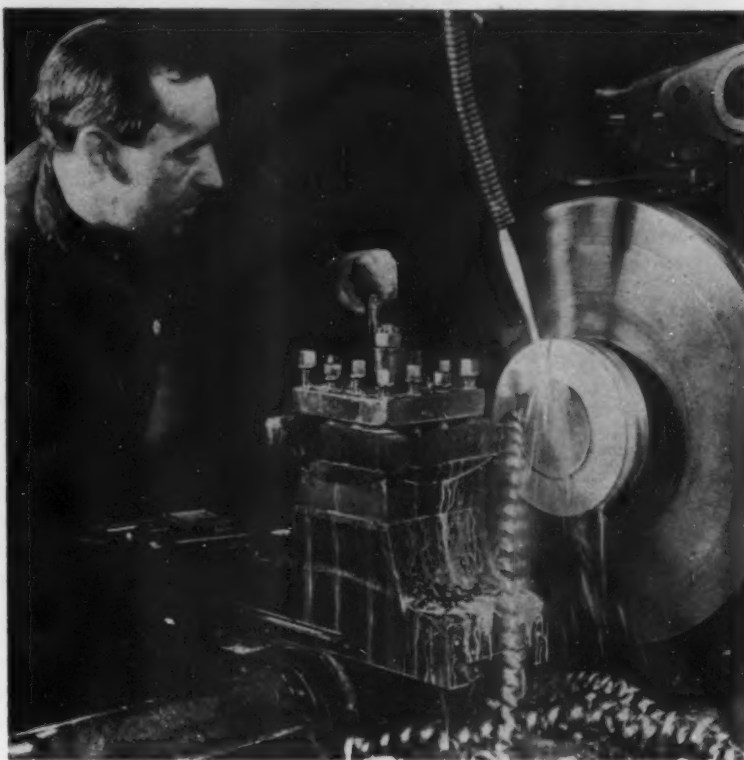
Supplywise they both are ample. But stocks of slab zinc in smelters' hands have soared to a several-year high point. Production of both have declined while imports are higher. Price trends will probably be limited to small variations.

**Tin . . .** Extremely sensitive to conditions in the Far East, tin has plummeted from its perch of \$1.21 per lb at the end of March to its current selling price fluctuating at a bit over 80¢. Production and supplies far outweigh consumption. And the long-term trend in tin use is downward, largely as a result of greater use of electrolytic tinplate.

Top this off with severe declines expected in tinplate sales for the next quarter and the result is very light demand.

**Nickel . . .** This is the only major metal still in a bad supply position. While the U. S. has signed a good many contracts—several at premium prices—to step up nickel production, this is a long-range project and effects to date have been barely felt.

Despite military cutbacks, demand for high-temperature alloys is so high that little is left over.



## Take the Curse off Cutting Oils

Most machine operators can testify to the difficulty of working with foul-smelling, rancid cutting oils. But even more important than the operator's discomfort is the increased cost that results when cutting oils and coolants turn rancid.

Cause of cutting oil breakdown is the heat created during metal cutting operations which causes bacteria to decompose and liberate hydrogen sulfide and sulfur dioxide. The bad odor that results is only one of the problems.

When cutting oils turn rancid they become acid and cause excessive corrosion of the work pieces, fail to do their primary job as a lubricant, and sometimes cause equipment shutdowns and loss of production.

To combat this problem, many manufacturers are finding that cutting oil additives are the solution.

Yale & Towne Manufacturing Co., Philadelphia Div., reported considerable difficulty with cutting oils that turned rancid, particularly during the summer months. At the suggestion of a coolant supplier, the company experimented with a cutting oil additive produced by West Disinfecting Co., Long Island City, N. Y.

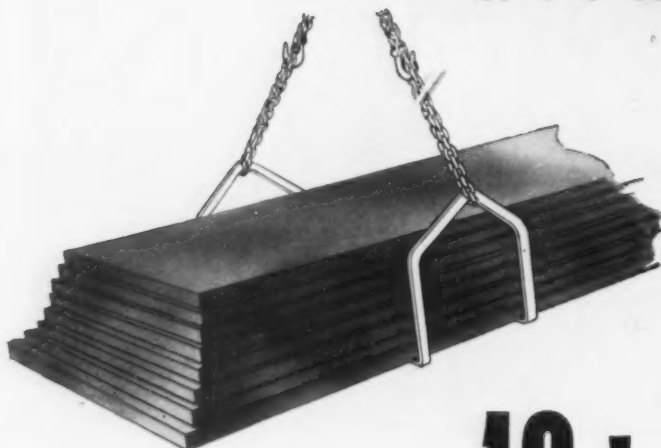
Tested on a drill press which had been having excessive difficulty because of rancid cutting oil, the company found that the additive made it possible to use the coolant for 3 weeks. Previously the oil had gone bad in 2 or 3 days.

The additive was then used in cutting oils in all the firm's metal cutting operations with similar results.

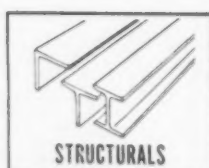
Success of the cutting oil additive is due to its composition, usually a combination of chlorinated and non-chlorinated phenols with an organic sequestering agent which adds to the effectiveness of cutting oils. Cost for some additives is less than  $\frac{1}{2}\epsilon$  per gal of cutting oil, it is reported.



a piece  
of  $\frac{1}{4}$ " rod



or 10 tons  
of  $\frac{5}{8}$ " plates



STRUCTURALS



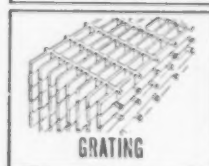
HOT ROLLED BARS



METAL WINDOWS



ALSYNITE PANELS



GRATING

Whatever the size of your order, you can be sure of getting dependable, efficient and prompt service at Levinson.

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## STEEL SALES COMPANY

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### Fuel

## Coal:

**Moody outlines program to revive South's coal industry**

Citing a 30 pct drop in bituminous coal output during the past six years, Joseph E. Moody, president of the Southern Coal Producers' Assn., stated last week that high production costs and excessive freight charges have hurt southern mine operators more than those in the North.

In a speech at the University of Kentucky he suggested a six-point program designed to solve this problem and to bolster coal.

(1) Stop cut-rate dumping of foreign residual fuel oil.

(2) Restrict uses of natural gas. Start by declaring pipelines to be common carriers.

(3) Reduce coal freight rates, particularly for distant southern mines.

(4) Cut high southern production costs which are largely a result of excessive wage rates that have hurt southern miners as much as producers.

(5) Seek better means of coal utilization and new uses, including production of gas and chemicals.

(6) Press for revision of tax laws to take into account the depression in coal industry.

### Costs Are Too High

Principal market losses, said Mr. Moody, are railroads, electric utilities and home heating. Biggest inroads have been made by natural gas, diesel oils.

Mr. Moody quoted statistics showing that railroads make more in transporting a ton of coal than operators who produce it.

He also pointed out that, largely as a result of geologic differences, productivity of southern miners is much lower than for northern miners. At the same time, wage rates are identical. This could lead to a labor-management decision to either close down the mines for good or to go non-union, he said.

Were Mr. Moody's suggestions likely to be followed? Expert observers did not give them much of a chance.



## GRAIN: Storage Bin Needs Grow

**Government offers cash inducements in hunt for more storage space . . . Needs in excess of 100 million bushels . . . Orders for 15,000 bins just a start—By A. K. Rannells.**

Want to get into the grain storage business? Chances are good for not only a fast tax writeoff certificate, but also a government guarantee for use of up to 75 pct of the warehouse space.

Also, signs are that business will be good over the more immediate future for manufacturers of steel and other types of bins for on-the-spot storage.

Trouble is that the government's price supports have resulted in more production than can be stored. U. S. Agriculture Dept. expects supplies of grain and oilseeds now in existence to continue large for the next few years.

### Offer Tax Writeoff

As a result, sleeves rolled up, Uncle Sam is working both sides of the street in an effort to find storage facilities for present and anticipated new surpluses.

Several plans are being actively promoted. They range from loans to farmers who build their own bins and sheds to storage guarantees and tax certificates to commercial warehouses and elevators.

Reason for the dither is that new crops of wheat, corn, oats, rye, barley, flaxseed, and soybeans are rapidly piling up on top of unexpectedly big holdovers.

Storage shortages now threaten in up to 15 states. Space shortage may become acute in some midwest states such as Kansas, Nebraska, Iowa, South Dakota, and Illinois—where the bumper corn harvest is at hand or already under way.

Typical of the government's problem is that in June the Agriculture Dept. had become resigned to buying enough bins to hold at least 50 million bushels.

It was evident by July that the figure would have to be doubled. It was then clear that holdover from old crops of corn and wheat alone would add up to 1.4 billion bu.

Space shortage was increasing, even after pressing into service storage space in the holds of two moth-balled shipping fleets.

Government orders were quickly placed for 15,000 store-bought grain bins, mostly steel, for shipment largely into corn-growing states. These were figured to hold upwards of 90 million bu. More are needed.

By August, it was plain that this was only a stop-gap measure. Under instruction of Agriculture Secretary Benson, Commodity Credit Corp. came up with its tax certificate and storage guarantee program.

Tax certificates will be issued commercial firms and cooperatives. But, CCC points out, John Q. Farmer will also be permitted to deduct construction costs in 5 years if he builds approved storage facilities.

Farmers' facilities are defined

by CCC for this purpose as "any corn crib, grain bin, elevator, or similar structure intended primarily for storage of grain . . . produced by him." Commercial facilities include warehouses and elevators.

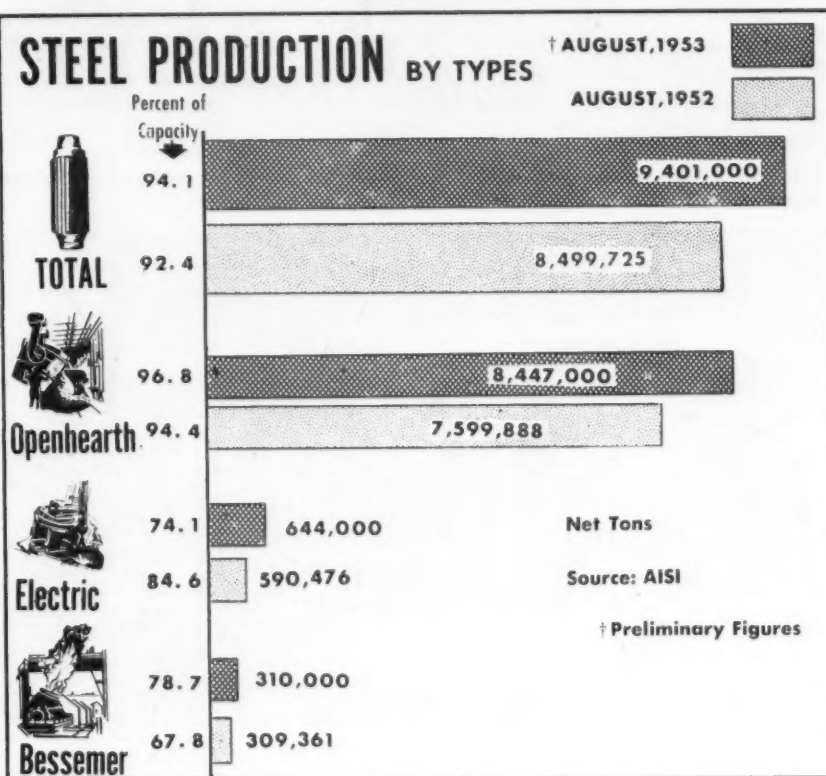
As further inducement for construction of new warehouses and elevators, the government will guarantee up to 75 pct occupancy for periods ranging from 3 to 6 years after the structure is completed.

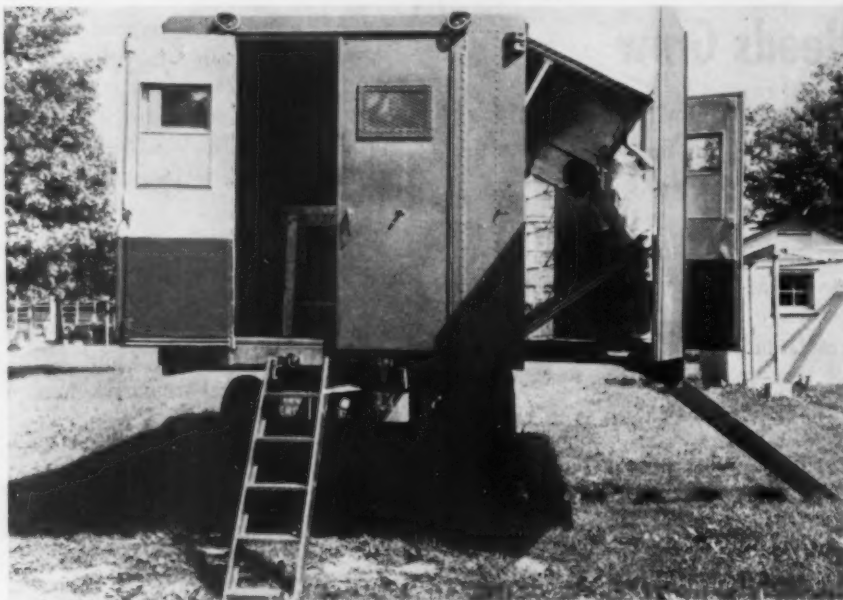
Going rates would be paid for occupied space. Unused space would be paid for not to exceed 75 pct of local rates.

## Study U. S. Tungsten Expansion

Methods of expanding the U. S. tungsten mining industry and developing new domestic sources of the material will be discussed at the first annual meeting of the Tungsten Institute, to be held in Seattle, Wash., on Sept. 22.

This recently organized group is particularly interested in the impact on supply of the extension of the government's tungsten trioxide purchase program.

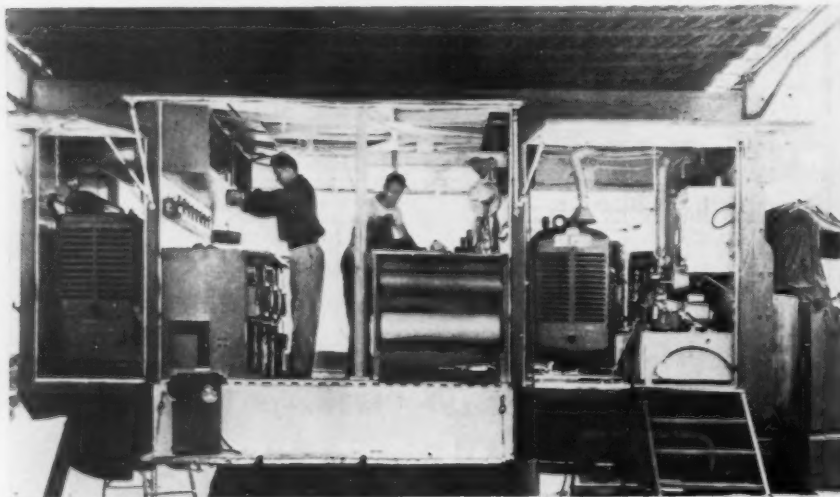




ARMY ENGINEERS are testing expansible vans. Here one side of a van is being expanded to a point almost 3 ft from original position.



GENERAL PURPOSE shop with welding equipment is mounted in semi-trailer. Can carry more and larger machines like drills, shapers.



CLEANING AND PRESERVING heavy engineer equipment for storage or shipment at forward stations is duty of this unit. Awnings protect items.

## Workshops:

**Army puts 'em on wheels . . .  
Tackle many field problems.**

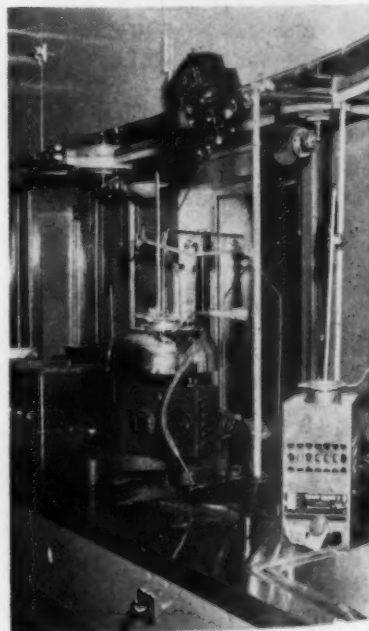
Mobility is vital in war. But war's machinery is getting more and more complex, leading to many maintenance problems that require heavy metalworking equipment.

Engineer Research & Development Laboratories at Ft. Belvoir, Va., tackled the problem by mounting machine shops, laboratories on special van-type trucks. They're being put through their paces at Ft. Belvoir.

Only 8 ft wide, 18 ft long and 8 ft high, the new cleaning and preservation unit packs enough facilities to condition many types of engineer vehicles. Items being serviced even get weather protection from retractable awnings.

Compactness is illustrated by a list of equipment contained: a generator, an air compressor, a sand blasting machine, a steam cleaner, dip tanks, a degreaser, fluid and air lines and hoses, grinders, a radiator purger, an oil changer, miscellaneous maintenance and processing tools and equipment.

Get the idea? They want to do anything, anywhere.



MATERIALS LAB equipment used to find flash point of bituminous materials.

## ECONOMY: Capitol's Confident, Careful

**Iron Age takes Washington pulse on prosperity . . . Finds it confident, though preparations are made for trouble if it comes . . . Congress thinks of employment—By R. M. Stroupe.**

When you take Washington's pulse on business questions you usually find it erratic. But when THE IRON AGE queried Administration people, legislators, and bureau chiefs it could find no strongly dissenting opinion to the idea that the state of prosperity today is sound.

Washington today is calm over the economic prospects of the nation. But behind the scenes you can detect preparation for trouble if it comes.

### Loaned to White House

A group at the White House level is considering action the government might take if a recession is seen materializing. Big problem is the detection of significant weak spots in the economy and to move swiftly to treat them before the infection spreads.

Chief soft spot detective is Commerce Dept.'s Under Secretary Walter Williams who heads a program to keep the government apprised of business trends, developments across the nation.

On loan to the White House, Mr. Williams maintains an office for receiving and evaluating reports from local leaders in industry and labor, distribution, transportation, banking, and farming.

His success depends greatly on how quickly he can detect and evaluate a worsening economic trend and how effectively the government can counteract it.

### Major Economic Report

Now regarded by Washington as one of the most important economic studies ever made, the forthcoming report by the President's Advisory Board on Economic Growth and Stability will outline suggestions on educational campaigns aimed at stabilizing consumer and business buying policies. It will indeed be a nice trick if anyone can do it.

This Administration group, headed by Dr. Arthur F. Burns, eco-

nomist adviser to the President, is also expected to offer recommendations on ways state and local governments can cure "creeping recession." A detailed report from the board is scheduled for presentation to the President within weeks. The contents may not become public knowledge.

Factors bolstering optimism among businessmen are doing a similar job on Washington people. Though the boom shows some signs of losing a shade of its momentum, the overall commercial and industrial scene has a predominantly healthy aspect.

### All's Not Serene

Now you can hear Washington economists interpreting imminent declines in production of some industries as merely symptoms of "serial readjustment" in which industries return to pre-boom status—or what business calls a normal market.

Yet, all is not serene here. If you speak to Congressmen from states containing industries more de-

pressed than most you can easily come away with a lopsided impression of economic conditions.

One of the middle-of-the-road pessimists is Sen. Homer E. Capehart, R., Ind., chairman of the Senate Banking Committee. He foresees "some danger in increasing unemployment" but he believes the economy is in a "generally good" condition.

Next year you may hear some pained yips from a number of Congressmen whose states are afflicted with plant layoffs. And there may come a renewed hubbub to grant defense contracts to distressed areas.

While record employment now is a source of joy to Congressmen whose constituents do not bang on the door to protest unemployment, any decline from the record employment rate of last August, 63.4 million, is likely to cause a ruckus.

Sen. Capehart wants to meet unemployment problems with a proposed bill that would create new jobs by making fast tax writeoffs available to business firms which want to expand their plants. Finding the plants which may want to expand in the face of increasing unemployment may be quite a problem to the Senator. It may be wiser to push a bill easing harsh depreciation laws to give industry as a whole the incentive to modernize.

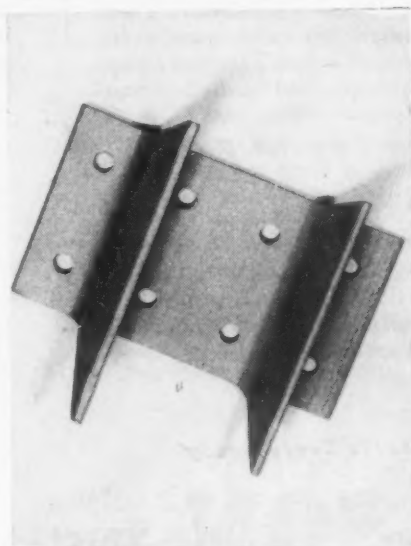
Another possible government move to offset unemployment is quick institution of public works programs.

### Loan U-235 to College Reactor

Atomic Energy Commission will lend enough fissionable uranium 235 to North Carolina State College to permit immediate operation of the nation's first college-owned nuclear reactor.

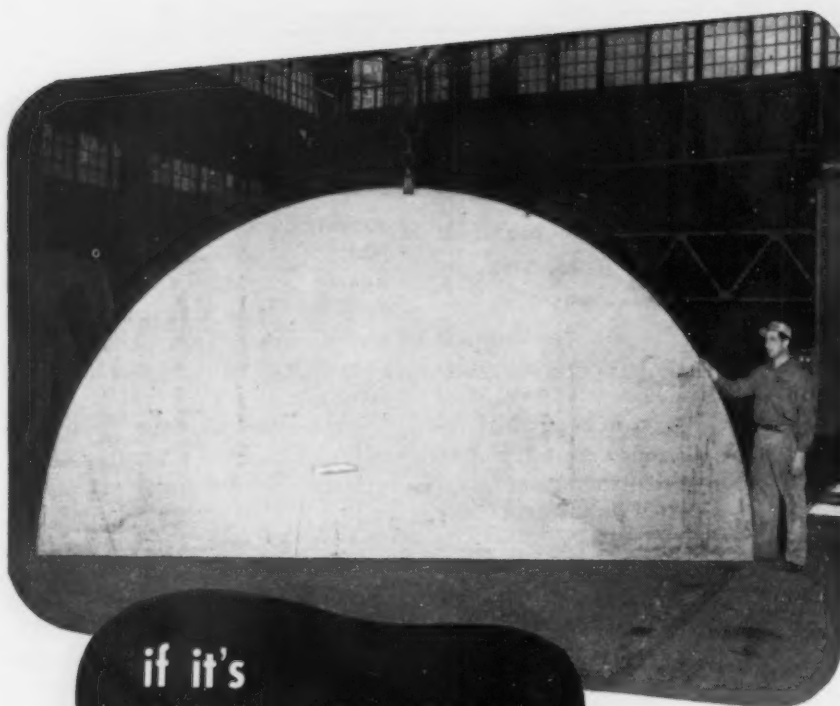
The lending arrangement will be based on a 1-year, renewable contract.

A program of research on the reactor itself, housed in a special building on the college's Raleigh, N. C., campus, is scheduled for the academic year ahead. In addition, the plant will supply reactor experience to undergraduate and graduate students.



RADOME-BRACKET attachment, used in military type Super Constellation transports being built by Lockheed, is believed to be first steel extruded part ever used on a production model airplane.





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*The segment of a tank head illustrated is typical. Made of 1" thick, Type 302 stainless steel, the head blank measures 210" in diameter and weighs approximately 9900 pounds. So accurately was this segment produced that no "truing up" of the abrasive cut straight edge was required prior to welding two segments together.*

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## Labor

### **JOBS: Handicapped**

**Industry a leader in breaking down barriers that prevent employment of handicapped.**

Although a great many handicapped people still find it difficult to get suitable jobs, encouraging progress has been made in providing more employment for this group during the last 10 years. And industry has been a leader in helping to break down many of the barriers that prevent the handicapped from obtaining work.

There are countless examples of the progress industry has made along this line. A large metalworking plant turning out automotive and aircraft parts has almost 100 handicapped workers on payrolls. Their jobs range from lathe work to inspection of electronic parts. And one of the workers there has risen from a bench job to a supervisor's post within 3 years.

#### **Korea Spotlights Problem**

**THE IRON AGE** learned of another firm employing more than 3000 workers which has an entire inspection department run by deaf mutes. This company has also found that blind workers can do a superior job in many types of work.

The Korean War has naturally made the problem of finding jobs for the handicapped even more important. In one plant a Korean veteran who lost one of his legs was unable to return to his job as a laborer in the blast furnace department, but the company started him back in as a plant truck driver and later made him an apprentice machinist. According to his foreman he's doing a fine job.

#### **Do More, Learn Faster**

Individual case histories are heartening, but there are still some industrialists who wonder if firms employing handicapped workers aren't just being charitable. But companies which have made it a standard practice to employ the handicapped say emphatically that this is not so.

Time and again tests have shown that these workers have the same

## Get More Chances

range of skills as other employees, produce more, are better safety risks and can be trained more easily because they are more anxious to learn.

The trend toward providing more job opportunities for the handicapped has had a profound effect on our national economy. In the last 10 years more than 2 million handicapped persons have been rehabilitated and placed in jobs. It is estimated that these workers will pay ten times more in taxes during their lives than it cost the government to rehabilitate them.

Last year alone, more than 250,000 persons were rehabilitated. As a result this group increased its earnings from \$16 million to more than \$116 million.

Authorities estimate that during the next 4 years these men and women will pay back about \$22.1 million in income taxes—enough to pay for entire 1952 rehabilitation program.

The campaign to increase employment opportunities for the handicapped is continuing. President Eisenhower has designated Oct. 4 to Oct. 10 as "Employ the Physically Handicapped Week." This is not just another poster campaign—for as the President expressed it, "We need them as active, productive citizens."



"You don't know me. I'm one of those 10,000 engineers that disappear each year."

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ASSEMBLE MANY PIECES—  
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ARTICLES—AS PART  
OF YOUR  
PRODUCT...**



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# INDUSTRY: Builds at Record in 1953

Outlays for new plants, equipment to reach almost \$28 billion this year . . . Tops '52 by 5 pct . . . Last half rate high . . . Some decline in fourth quarter . . . Year by year rates.

America's productive plant this year will spend \$27,821,000,000 on new facilities, new equipment, outstripping even 1952's record \$26,455,000,000 by 5 pct, report Commerce Dept. and Securities and Exchange Commission.

Estimated on the basis of an August survey, the figures indicate industry will spend \$14.4 billion in the last half of the year. The third quarter should see the peak of plant and equipment investment, followed by a moderate decline in the fourth quarter. Official guesses stop short with year's end but economic observers believe that a gradual slide will continue into 1954 as the boom loses a shade of its momentum.

## Manufacturing Gain

Expenditures by the iron and steel industry are expected to fall only slightly below last year—from \$1,538,000,000 in '52 to \$1,460,000,000 this year. The decline in 1954 should be more marked as the industry finishes post-Korea expansion.

Manufacturing in general will boost spending to \$12.7 billion, for

a 6 pct gain over 1952. In this category, durable goods producers will register a 3 pct gain while non-durable goods will climb 8 pct.

Metalworkers will invest about \$385 this year, machinery manufacturers, \$900 million—both substantially over 1952. On the decline since 1951, railroads were the only group showing a marked slide—about 7 pct down from '52. Chemical, electrical machinery showed rises ranging up to 20 pct.

Transportation (other than rail) will edge down this year, with investment just under 1952. Public utilities invested \$3,838,000,000 last year and this year will reach \$4,425,000,000. Both transportation and utilities indicated they will shave outlays a trifle in the third quarter.

## Spending Stimulators

American industry's investment in plant and equipment started a brisk forward march in 1945, faltered a little and then quickened its pace. Expenditure trend is as follows: 1945, \$7.5 billion; 1946, \$12.9 billion; 1947, \$17.4 billion; 1948, \$20 billion; 1949, \$18 billion;

## INDUSTRY UPS EXPANSION

(In Millions of Dollars)

	1953	1952	Pct Change
Manufacturing	12,490	11,994	+ 4
Durable goods industries	5,955	5,704	+ 3
Non-durable goods industries	6,735	6,210	+ 8
Mining	892	880	+ 1
Railroads	1,294	1,391	- 7
Transportation, other than rail	1,357	1,343	0
Public utilities	4,425	3,838	+15
Commercial & other	7,159	6,989	+ 2
Total	27,821	26,455	+ 5

1950, \$17.8 billion; 1951, \$23.2 billion; 1952, \$26.5 billion; and 1953, \$27.8 billion.

First impetus to this advancing rate of investment was post-war pent-up civilian demand which spurred industry expansion. In 1949 the rate turned down amidst recession cries which extended into 1950 and dropped industry's spending rate again.

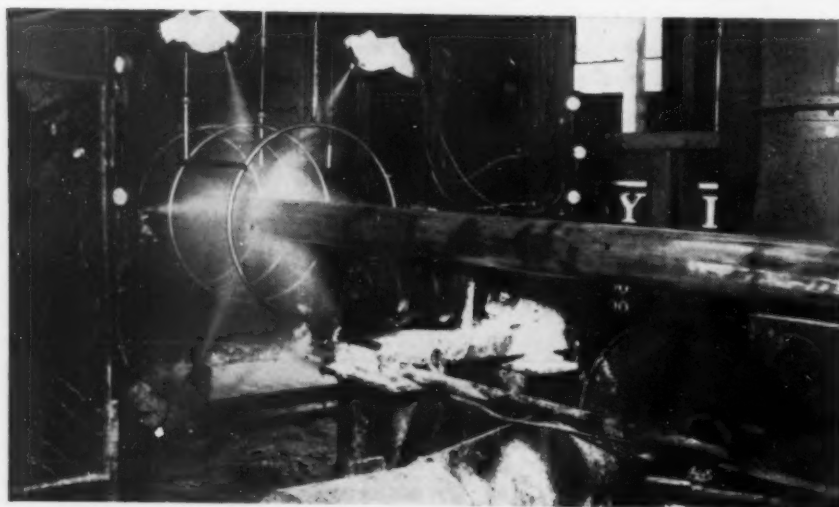
Resurgence of demand in 1951 coupled with business activity due to the Korean War jacked up spending substantially. Of weighty importance to increasing investment for the past 3 years were fast tax writeoffs, calculated to increase industrial capacity in line with defense mobilization needs. Those industries unable to earn certificates of necessity nevertheless expanded as buying demand rose to record heights.

## Lay Keel for Cargo Ship

Keel was laid this week for the first large privately-owned ocean-going vessel to be built on the West Coast in 24 years. Bethlehem Pacific's San Francisco Shipyard is building the first of three Mariner-type vessels, recently purchased by Pacific Far East Line from the Maritime Administration.

The SS *Golden Bear* is expected to be delivered late next fall. It's a single screw, high speed cargo ship and will incorporate many new features.

Several Bay area congressmen, city officials, representatives of the Maritime Administration and industry members were on hand.



ELECTRONIC SPRAY PAINTING line at Ambridge, Pa., plant of Spang-Chalfant Div., National Supply Co., coats steel pipe at a speed of about 500 feet per minute.



# STRIP STEEL: Europe Can Make More

**West Europe's wide-strip capacity expected to increase 10 million tons in next 3 years . . . Stiffer competition for U. S. . . . Mills may operate under full capacity.**

U. S. steelmakers and manufacturers may be faced with the double threat of decreasing European demand for flat steel products and stiffer competition in other markets as a result of completed or planned increases in European wide-strip capacity.

British Iron and Steel Federation (BISF) expects European wide-strip capacity to be upped 10 million tons in the next 3 years. It lists a world total of 58 known strip mills either in operation or definitely planned. Of these, 36 are in the U. S., including three continuous mills used primarily for rolling plates. Europe has 15 mills, and there are seven more located in other countries.

## U. K. Leads Expansion

Prior to the war, Continental Europe had only one fully continuous wide-strip mill and one Steckel mill, both located in Germany. Since the war, however, practically every West European steelmaking country has emphasized increased production of flat-rolled products in its reconstruction plans.

BISF points out Britain has been the bell-cow in West Europe's drive to increase flat product output. Britain now has three continuous hot strip mills in operation, including one at Margam which is rated among the largest in the world. It is the only country, excepting the U. S., with more than two such mills.

## Prices Will Drop

In the haste to get into the wide strip mill race, it seems some European mills have been located without regard for economical production. And the United Nations Economic Commission for Europe in a recent report on the European steel industry points out that only the United Kingdom has attempted to step up its steelmaking facilities

sufficiently to make it possible to operate the continuous strip mills at capacity.

Whether Europe will attempt to increase its steel production for full capacity strip mill operation depends largely on market prospects.

## Need Larger Market

Experience of the U. S. in ushering in continuous strip mills shows that there was sharp drop in the relative prices of sheet and tinplate and a phenomenal increase in demand. BISF believes there will also be a decrease in the relative prices of European flat products as more and more strip mills come into production. A marked improvement in quality is also expected.

The Federation points out, however, that the U. S. has a much higher income level than Europe and as a result its market for end products such as cars and appliances is much larger. Because of this difference, Europe's strip mills may undergo a period of below-capacity operations before the new mills can produce at maximum.

BISF says this period of limited production could be shortened and possibly eliminated if a concerted move is made by both producers and consumers to expand the market for thin flat products.

# Tinplate:

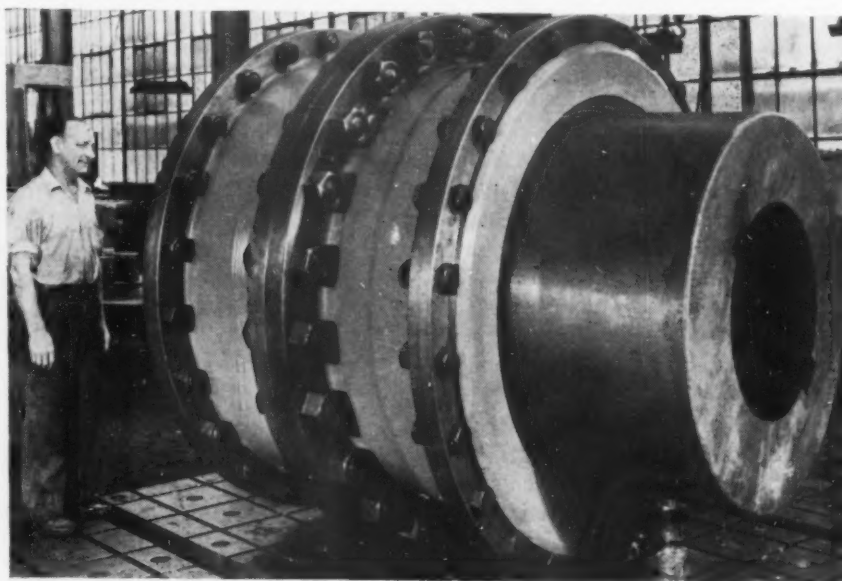
## U. S. Steel Export cuts prices to meet foreign competition

Faced with a plummeting export market, U. S. Steel Export Co. has cut prices of tinplate nearly \$10 per ton. Tinplate producers' sales in general are expected to be as much as 50 pct lower in the fourth quarter (See THE IRON AGE, Aug. 27, p. 39).

Some estimates put the next quarter drop of tinplate exports as high as 70 pct. Exports have been declining steadily because of greater foreign production, lower foreign prices and dollar scarcity in buying areas abroad.

## List New Prices

New prices posted by the export firm are: USS American common coke tinplate (1.25-lb coating) Superdraw, \$9.58 per base box; USS Ferrostan 25 (0.25-lb coating-electrolytic, Superdraw), \$8.26 per base box; USS Special coated manufacturing terne, \$8.60 per



IT TOOK Koppers Co. 6 months to machine and assemble this self-aligning coupling, said to be one of the largest ever built. It will be used on a Mesta 4-high plate mill.

base box, and USS black plate, Superdraw, \$7.38 per base box.

These prices are 50¢ per base box lower than the previous quotations. A base box consists of 107 lb or 112 sheets of 14 x 20 in. tinplate. Freight is included to New York, Philadelphia and Baltimore. Effective date was Sept. 9.

At the same time, U. S. Steel Corp. indicated domestic base prices for tin mill products would remain unchanged for Oct. 1, 1953 through Mar. 31, 1954, despite the recent general increase in steel base prices.

One of the few materials to decline in price recently has been pig tin, though this is offset by many other increases in steelmaking costs.

## Gas Turbines:

### U. K. may try to operate turbines on blast furnace gas.

Britain is currently researching the chances of operating gas turbines on blast furnace gas. This is already being done in Spain and Luxembourg, where installations are primarily power generation sets. But they can also be used to supply air for bessemer converters or blast furnaces.

In recent years several proposals have been made for establishment of similar installations in Britain, but postwar economic problems have made it impossible for any one company to undertake the project single-handed.

### Study Possibilities

One of the difficulties is that until the method is proved reliable, it can only be used as a duplicate to existing blowing and heating equipment. Also, capital investment required for such an installation is estimated at between \$700,000 and \$1.12 million.

Now the British Iron and Steel Research Assn. is trying to turn the trick by undertaking the project on a cooperative industry basis. If the plan goes through, the first installation will probably be made on a medium size blast furnace of 18 to 25 ft hearth diameter.

One gas turbine advantage is its consumption of low thermal value fuel—such as is produced by blast furnaces. Unlike internal combustion and diesel engines it burns fuel continuously instead of intermittently and in a relatively large combustion chamber rather than in a small cylinder compression head. Result—the gas turbine does not need high octane fuel.

### Generates Electric Current

Since a gas turbine can burn blast furnace gas directly, it provides instant power without generating steam as an intermediate working fluid.

It is believed the hot exhaust gases of a gas turbine might be used to heat blast furnaces which would save about 10 pct of the blast furnace gas produced. This could be used for other purposes. In addition, gas turbines might eliminate the need for Cowper stoves and could also be linked with alternators to generate electric current, European engineers say.

## Set Magnesium Export Quotas

U. S. Office of International Trade has set a fourth quarter export quota for magnesium metal (in all forms) at six million lb.

Quota applies to magnesium powder (Schedule B No. 619152); Metal and alloys in crude form, and scrap (664547); and semi-fabricated forms, not elsewhere classified in Schedule B (664549). It is the same as that established for the third quarter, which included a supplemental quota of three million lb.



"He overplays the skilled worker theme."

## Air Force Tips Hand on Jets

Types of jet engines which the Air Force plans to install in some of its newest fighters have been revealed by Washington slip-up.

One of the power plants involved is the J-71 jet, for use in the F-105. The J-71 reportedly has a thrust rating of about 10,000 lb—almost twice that of U. S. engines in current use. In modified form, it will power the new B-66 reconnaissance bomber.

Plans for installing the J-71 were disclosed in a routine Air Force regulation describing how to make out aircraft engine reports. Most of the engines named are well known, but apparently through error the regulation also listed engines for the F-101, F-102, and F-105.

Little information on these fighters has been made public, though another Air Force regulation recently disclosed that the F-105 would be built.

## New Engine for Navy Cutlass

Westinghouse Electric Corp. is producing a new turbojet engine, the J-46, which will power the latest version of the Chance Vought F7U-3 Cutlass, a Navy carrier-based fighter.

Earlier models of the Cutlass used the Westinghouse J-34 jets.

Combining high power and low weight, the J-46 has successfully completed the Defense Dept. 150-hr qualification test, necessary before quantity production is authorized. It will be turned out by the Westinghouse jet engine plant in Kansas City, Mo.

## Lock Horns on Manganese

A government decision to put more money into Westmoreland Manganese Corp. plant at Batesville, Ark., or to pull out of the deal is expected shortly. Defense Materials Procurement Agency has advanced over \$2.9 million out of \$3.8 million.

Westmoreland claims the money is needed. General Services Administration claims the company is in default. GSA-appointed engineers are surveying the project.

# New Handling System Speeds Production of Grinnell Fittings

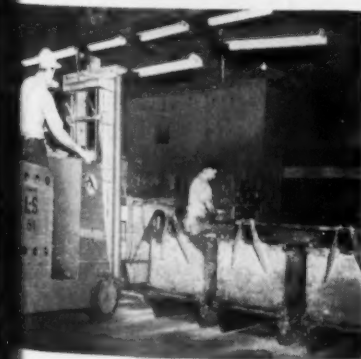
Grinnell Company switched from hand trucks to dependable Lewis-Shepard SpaceMaster Model "E" Electric Trucks, and had a tough problem handling small castings coming out of the foundry.

## Before SpaceMasters . . .



These space-eating, non-stacking shop barrels caught castings at end of foundry conveyor. Man with 2-wheeled hand truck lugged full barrel to a grinding machine. Machine operator, according to a Grinnell engineer, "... worked with one arm and head in the barrel, his other arm in the machine."

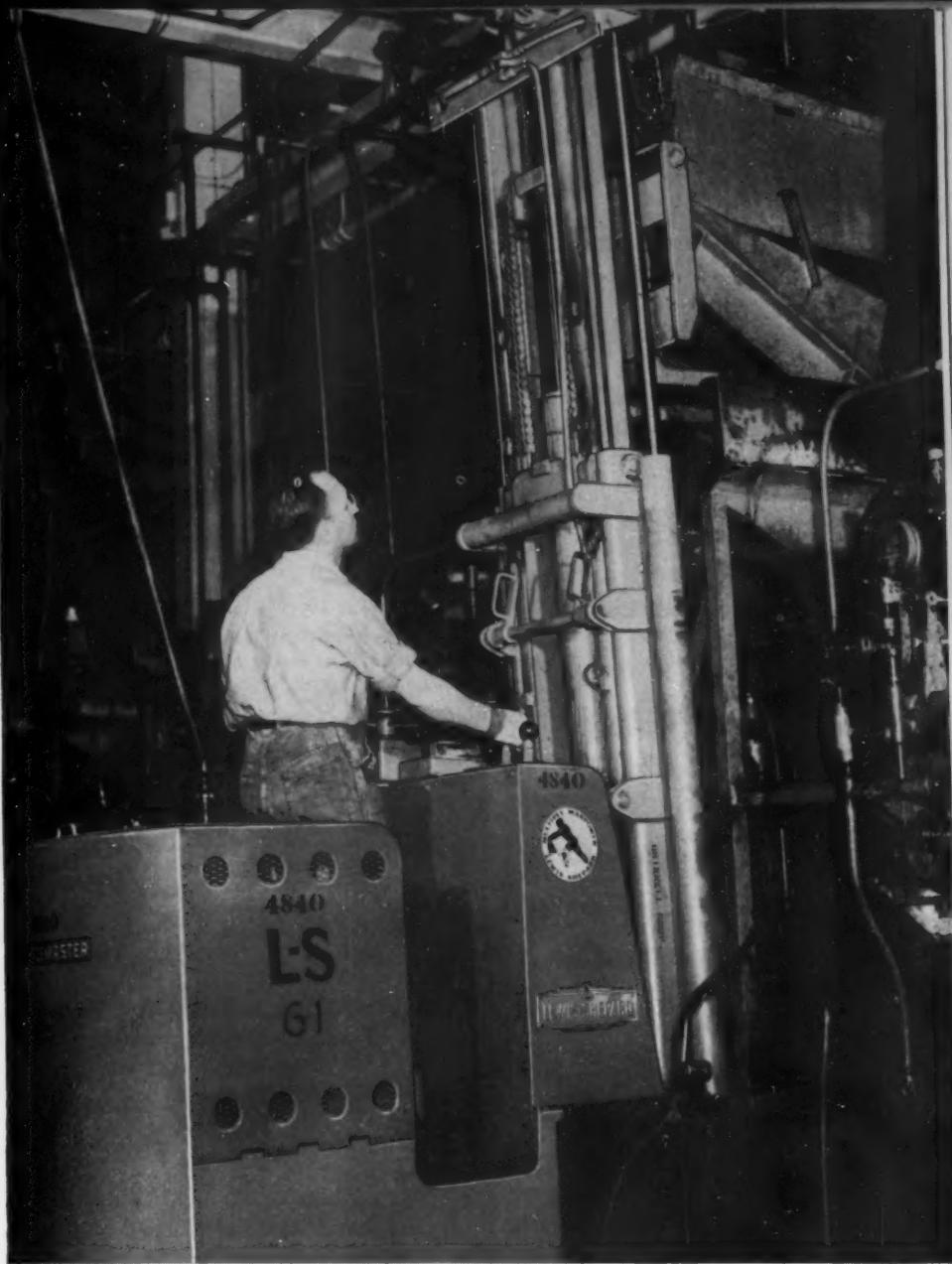
## After SpaceMasters . . .



Drop-bottom boxes catch castings from foundry conveyor. Lewis-Shepard Model "E" picks up box, carries it to a grinding machine, lifts it above feed hopper and dumps castings. Boxes can be stacked, handled efficiently.

## About this Truck . . .

Lewis-Shepard's Standrive design permits easy trailing of load — operator has full, unobstructed visibility to rear. Center control gives operator all round protection, permits him to get on and off quicker. Capacities to 4000 lbs.



Lewis-Shepard SpaceMaster Electric Fork Truck lifts drop-bottom box to dump castings into feed hopper at a tapping machine.

The results at Grinnell, where man-handling was eliminated, storage efficiency improved and costs lowered, can point the way to greater efficiency for you. For full information regarding the cost-saving materials handling equipment from Lewis-Shepard, call your local L-S Representative or mail the coupon today.



Listed are some current L-S reorders from blue-chip companies in various industries.

Motor Car	45 L-S in use — reordered 2
Grocery Chain	73 L-S in use — reordered 6
Chemical	14 L-S in use — reordered 5
Elec. Goods	194 L-S in use — reordered 14
Carbon Mfr.	23 L-S in use — reordered 4
Mfg. Chemicals	74 L-S in use — reordered 6
Glass Mfr.	12 L-S in use — reordered 12
Rubber Goods	5 L-S in use — reordered 5

Case history Proof Folders include facts, figures and familiar company names. Handy Comparison Charts that help you to make your own decision are yours for the asking.

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Company .....

Address .....

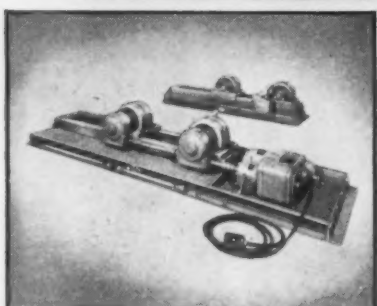
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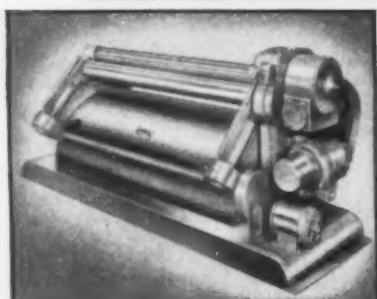
## Modern Metalworking Equipment

- BENDING ROLLS
- TURNING ROLLS
- AUTOMATIC WELDING FIXTURES



### REED PORTABLE TURNING ROLLS

- ★ In 5 models; capacities up to 75 tons
- ★ For hand or automatic welding, finishing operations on tanks up to 14 ft. diam.
- ★ Reversible, variable speed adjustment
- ★ Rugged, all-steel construction
- ★ Built-in silent worm gear drive



### REED PLATE BENDING ROLLS

- ★ In 18 models, ranging from 3 ft. x 10 ga. to 8 ft. x 1/4" in capacity
- ★ Rugged, all steel construction
- ★ Built-in, silent worm gear drive
- ★ Durable, special bronze bearings
- ★ Power adjustment & air drop end available on most models

WE INVITE YOU . . .  
to write us for specifications, prices,  
to list of REED users near you. No obli-  
gation. Just write on your letterhead.

**REED ENGINEERING CO.**

1006 W. FAIRVIEW, CARTHAGE, MISSOURI

# Industrial Briefs

**It's Official . . .** WILLYS-OVERLAND EXPORT CORP. has received official approval from the Japanese Government for the first agreement ever signed for the manufacture of American motor vehicles in Japan. Agreement is with Mitsubishi Heavy Industries Reorganized, Ltd.

**New Subsidiary . . .** THE A. F. HOLDEN CO. recently acquired a wholly owned subsidiary, Cook Heat Treating, Inc., Los Angeles.

**Gets Contract . . .** STANDARD BOILER & PLATE IRON CO., Pittsburgh, has been awarded a contract by Ford Motor Co. covering relining of blast furnace "C" at Ford's River Rouge Plant.

**Declared . . .** ARTHUR G. MCKEE & CO., Cleveland, has declared a dividend of 60¢ per share on the common stock, payable Oct. 1.

**"Convertible" Buses . . .** TWIN COACH CO. has received an Army Ordnance contract for the production of 36 "convertible" buses. These buses can be changed from 36-passenger buses to cargo trucks simply by removing socket-type seats.

**Exclusive Basis . . .** INGERSOLL PRODUCTS DIV., Borg-Warner Corp., has appointed Daymel Co. exclusive distributor of the Ingersoll 3-Way self-storing aluminum storm windows and doors with Koolshade for greater Chicago and eastern Illinois.

**Hopper Cars . . .** AMERICAN CAR & FOUNDRY CO. has received an order from the Illinois Central Railroad for 100 70-ton covered hopper cars. Round hatches to facilitate loading and unloading and provide for better protection for the commodity carried are new features of these cars.

**Drive Is On . . .** Pittsburgh industrialists have begun a drive to bring an "ENGINEERING CENTER" to the city. If successful in persuading technical societies to make their headquarters in Pittsburgh, the promoters would plan to have a building erected to house the groups.

**New Course . . .** NEW YORK UNIVERSITY, New York, will hold a seminar in the International Management Movement beginning Sept. 21.

**Experts Wanted . . .** NATIONAL MALLEABLE & STEEL CASTINGS CO., Cleveland, has established a scholarship aimed at helping produce more experts in the foundry field at Illinois Institute of Technology.

**Fire Protection . . .** U. S. FIRE PROTECTION ENGINEERING SERVICE, INC., Kansas City, has been established by a group of experienced fire prevention and fire protection engineers to assist management in economically solving these problems.

**Golden Anniversary . . .** THE IDEAL ELECTRIC & MFG. CO., Mansfield, Ohio, is celebrating its 50th year.

**Jet Engines . . .** WESTINGHOUSE ELECTRIC CORP. and The Navy report that Westinghouse has developed and placed in production a new high power, low weight turbojet aircraft engine known as the J46.

**Hear Ye . . .** THE DIVERSEY CORP., Chicago, has purchased the Selcon Engineering & Chemical Co., Chipewa Falls, Wis.

**Helping Hand . . .** ALUMINUM CO. OF AMERICA will put into effect a college scholarship program for its employees' children this school year.

**Moved . . .** CLARK EQUIPMENT CO.'s southeastern regional sales manager has moved his headquarters from Norfolk, Va., to 161 Spring Street Bldg., Atlanta, Ga.

**Appointed . . .** THE BAKER RAILROAD CO., Baker Industrial Truck Div., has appointed Hohl Industrial Sales Co., Inc., Buffalo, as representatives in eastern New York state.

**New Plant . . .** SHELL CHEMICAL CORP. will erect a new plant at Norco, La., to produce allyl chloride and epichlorohydrin.

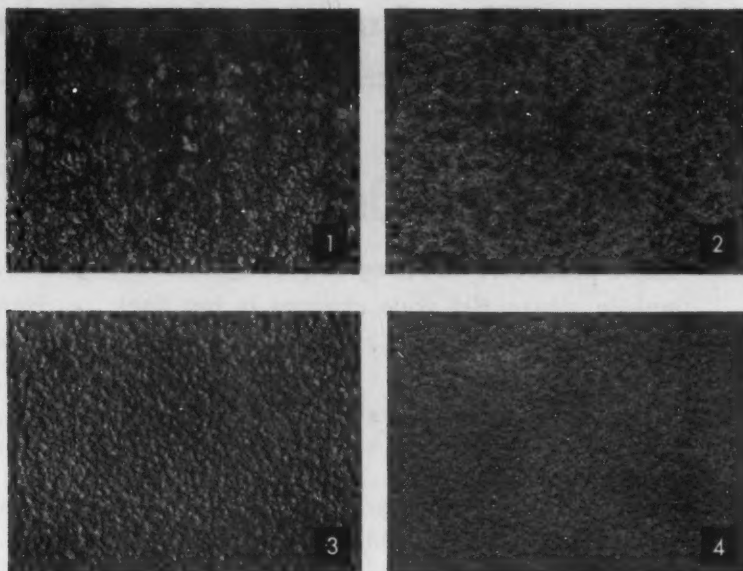
**Midwest Rep . . .** SIMMONS MACHINE & TOOL CORP., Albany, has appointed Clare Perlin & Associates, Park Ridge, Ill., as midwest representative.

**Filter Sale . . .** TITFLEX, INC., Newark, N. J., reports the sale of design and manufacturing rights of its industrial filter for the electroplating market to Wagner Bros., Inc., Detroit.

Specify



for  
**Longer Life**  
through  
**Corrosion**  
**Resistance**



Photographs show effects of atmospheric corrosion after six years' exposure of unprotected surfaces.

1. Low carbon sheet steel showing friable heavy rust.
2. Low carbon sheet steel with rust removed showing heavy pitting.
3. N-A-X HIGH-TENSILE sheet steel showing tightly adhering rust.
4. N-A-X HIGH-TENSILE sheet steel with rust removed showing absence of excessive pitting.

Low carbon sheet steel lost four times more weight than N-A-X HIGH-TENSILE in six-year test. With increased time this ratio becomes greater.

N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent.

Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

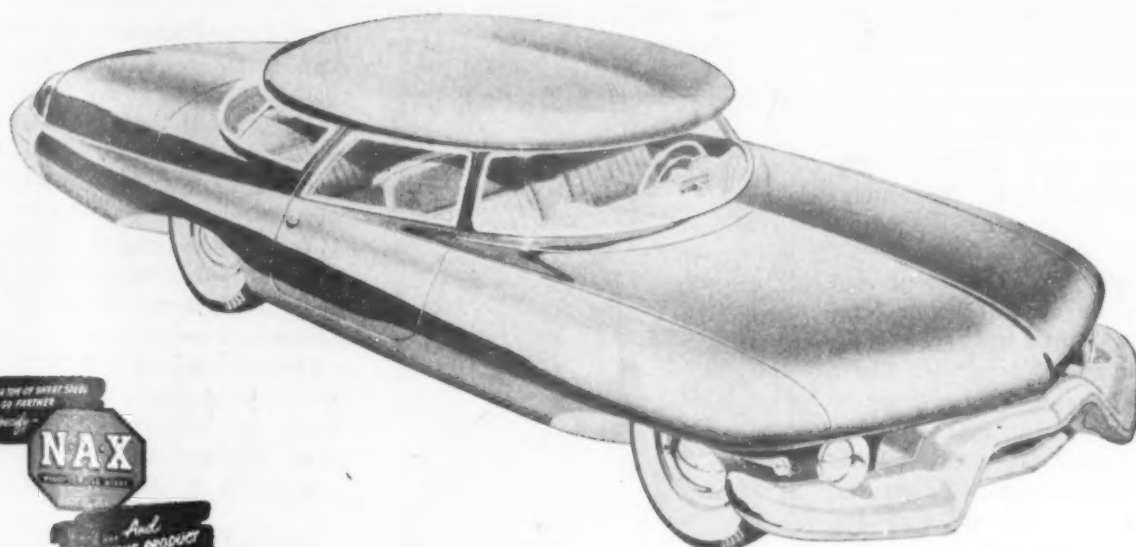
Your product can be made lighter in weight . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

## GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division

Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION



KEEP YOUR SCRAP MOVING TO YOUR DEALER

# The Automotive Assembly Line

## Sales Hope Rides On New Models

**Major producers stressing new designs, new engines . . . GM making substantial style changes in top lines . . . New Ford engine boosts power . . . Expand lines—By R. D. Raddant.**

At the first hint of autumn, a strange kind of virus creeps through Detroit.

It may start in the administration building of Chrysler, jump across town to Hudson, spread through the corridors of the General Motors Building, or break out at Ford's River Rouge plant.

This extremely contagious bug, new car virus, spreads to outstate Michigan, into other automotive centers throughout the country, and eventually into every corner of the nation.

**Important Epidemic . . .** And it's a good thing it's catching. If it weren't, automakers would have a tough time selling the 5 to 5½ million new cars they expect to build in 1954. On attaining this goal also hangs a great deal of the welfare of supplying industries and of the comfort of millions of workers.

It will have to be done in 1954 with a maximum of three new cars and three new engines. At first glance this doesn't seem to be a lot to attract a market of this size. But by the time all the faceliftings and trim revisions are completed, with appropriate fanfare, salesmen will have a lot to work with. It is hoped customers will be sufficiently weakened by the annual fever.

**GM Plans Full Treatment . . .** Biggest changes will be in General Motors' three top lines: Cadillac, Buick and Oldsmobile. These divisions have not had any major styling revisions in several years, will get the full treatment in 1954.

Any close follower of automotive trends got a preview of GM's plans in the fiber glass dream cars that toured the country this year. This

is particularly true in Buick where the Wildcat influence will be apparent.

All three of these new cars will feature the wrap-around windshield, with longer, lower body lines and bold rear fenders built up in planes rather than curves. Look for revisions in the traditional Cadillac rear lines, a higher, bolder rear fender for the Buick, and a LeMans type grille for the Cadillac.

**Olds Is Lowest . . .** Eye catcher of the lot may be Oldsmobile, according to stories coming out of Lansing. It is reported to have the lowest body styling at GM. To further this effect, the transmission is suspended below the frame to avoid the space-consuming front seat bulge.

Chevrolet and Pontiac will not have new bodies, but modifications will give them new appearances. Pontiac has been the big mechanical question mark all year as this division raced against time to tool for a new V-8 engine.

For a time it appeared doubtful that the new powerplant would be

available for next year, but tooling has been delivered and it looks now that a new overhead valve V-8, turning out about 145 horsepower, will be ready for the new models.

**Replace V-8 . . .** Another new engine will provide the new powerplant for Ford, replacing the time-tested V-8 that has powered more cars than any V-8 engine ever constructed. This new engine, which is already being built, will increase Ford horsepower from a present maximum of 110 to possibly over 130 hp. Some of this boost was needed to improve performance with automatic transmissions.

Mercury will also have a new engine, increasing thrust from 125 to better than 140 hp. Mercury and Lincoln will not radically change body lines, although introduction of a Lincoln Continental is a possibility.

Power fiends will find plenty in 1954 lines, with Cadillac, Lincoln, Chrysler and Packard all expected to boost their already substantial output. Engines generating more than 225 hp will appear in probably three of these lines.

**Top Secret . . .** Traditional security shields are placed around all new cars. Procedures to avoid premature disclosures take one of two forms or a modification of both.

Favorite method is to prevent any word getting out at all, but leaks are too easy to assure 100 pct security. The second method is to take the press into the automaker's confidence, show them their product, but pledge them to secrecy.

Getting back to new cars, Hudson will be the first 1954 car to make its appearance with new rear lines and added power, and new grille and trim.

**Expand Lines . . .** Chrysler Corporation divisions will follow in October





and November. Changes will be largely confined to facelifting, but with significant improvement in exteriors and restyled interiors. Plymouth is expected to introduce a luxury model to compete with Chevrolet's fabulously successful BelAir and Ford's Crestline series.

This is a significant trend—the extending of the number of models of individual manufacturers so that the line reaches into another price bracket, preferably into a higher one. There is little tendency to reach downward these days, although some of the higher priced cars, notably Buick, have had extreme success in their less expensive lines.

Notable change in Packard will be its further separation of the Packard and lower priced Clipper lines in styling and appearance. Packard will continue its comeback with emphasis on class.

**Keep Studie Styling . . .** Studebaker probably will do little to alter the highly successful lines of its 1953 models, still considered to be the most significant and influential of all current stylings. A convertible will be added to the line, giving this independent a car bordering on the real sports car.

Nash's styling plans are not too well known, but come under the heading of facelifting. The Continental look will continue to be emphasized.

**Push New Appliances . . .** Because of Kaiser Motors' numerous problems, not a great deal is known about plans for either the Willys line or Kaiser. A reorganization of manufacturing may make more news than the new cars themselves.

Throughout the field there will be a strong drive to make new appliances such as power brakes and power steering as universal as is the automatic transmission today.

## Hydramatic Shortage Still Hurts

Still in a quandary, at least at press time, over its transmission, is Lincoln, paralyzed by Hydramatic supply lost in the GM fire.

Tests apparently indicated that an adaptation of the Borg-Warner Mercomatic transmission did not satisfy Lincoln requirements, leaving Lincoln still dependent on GM's resuming Hydramatic production.

It is talked around that Lincoln has frozen plans for its own transmission, but still must rely on outside sources until production can be tooled, probably not before 1955.

Elsewhere on the transmission front, Cadillac resumed production Sept. 8, using Buick's Dynaflo. Production will be accelerated as quickly as delivery of the twin turbine torque converters can be expedited. Oldsmobile will also get back into production shortly.

A lot of Cadillac's and Oldsmobile's speed of recovery is based on Buick's ability to deliver, obviously. One hopeful sign is that Buick may have an earlier than usual model change, freeing for at least a time all its Dynaflo production for the stalemated divisions.

## Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS*	TRUCKS
Sept. 12, 1953..	101,185*	19,997*
Sept. 5, 1953..	110,852	21,722
Sept. 13, 1952..	109,272	28,023
Sept. 6, 1952..	90,885	20,210

\*Estimated Source: Ward's Reports

## Ford, Plymouth Plan Expansion

Two announcements of more than passing notice came from Ford and Plymouth last week.

First was the official word from Ford that a new stamping plant will be constructed near Cleveland. (THE IRON AGE, Sept. 10, p. 121). It will give Ford its fourth major plant in the Cleveland area. The plant will contain 15 major press lines and will be devoted to production of body parts.

Plymouth will assemble bodies for club coupes and 3-passenger coupes in the Chrysler Corp. plant at Evansville, Ind., in an area to be released next month by completion of the plant's current defense assignment.

## THE BULL OF THE WOODS

By J. R. Williams





**we are expanding our facilities to bring you...**

# more "Desegatized" steel- faster!

In order to improve our service to tool steel users, we have expanded our warehousing facilities since October, 1950, by erecting a new warehouse at Los Angeles to serve the West Coast . . . moving from downtown Chicago to a new, larger warehouse in suburban Melrose Park, Illinois . . . replacing our Detroit warehouse with improved location and facilities at Centerline, Michigan . . . adding to warehouse at Hartford to nearly double its capacity . . . enlarging warehouse and shipping facilities at Latrobe.

**and now**—we are moving our New York district sales office to a new office and warehouse at Hillside, New Jersey. Just south of Newark, this location is ideally suited to serve our many customers in northern New Jersey, greater New York and the Hudson River valley.

*A growing fleet of Company-operated trucks brings plants east of the Mississippi River within a one or two day delivery cycle from our warehouses or our manufacturing facilities at Latrobe, Pennsylvania.*

## LATROBE STEEL COMPANY

LATROBE, PENNSYLVANIA  
SOLE PRODUCERS OF "DESEGATIZED" STEELS

BRANCH OFFICES AND WAREHOUSES									
BOSTON	BUFFALO	CHICAGO	CLEVELAND	DAYTON	DETROIT	HARTFORD	HILLSIDE, N. J.	TOLEDO	
LOS ANGELES		MILWAUKEE	PHILADELPHIA		PITTSBURGH	ST. LOUIS			
EUROPEAN OFFICES IN									
GENEVA	PARIS	BRUSSELS			ROTTERDAM			MILAN	

## This Week in Washington

### Freight Showdown Due This Winter

**Return to competitive steel market emphasizes need for revision of freight absorption laws . . . Congress apathetic in past . . . Capehart, Reed map new drive—By G. M. Baker.**

Increasing customer resistance to the freight bills now tagged to steel shipments points to a congressional showdown next year on freight-absorption legislation. (See p. 95 for story on steel industry's changing freight absorption picture.)

Bills to clarify the right of sellers to pay freight on the products they ship have lain dormant on Capitol Hill for the past several years. As long as steel, cement, and other heavy industrial commodities enjoyed a ready market, there was little pressure upon Congress for corrective action.

**Competition Shifts Story . . .** Today, with more and more customers exercising their right to shop around in the steel market, the story is different. There's a growing belief among steel-state congressmen that a legislative straightening out of the delivered price problem can no longer be postponed.

In this year's congressional session, bills authorizing sellers to pay freight charges languished before Senate and House subcommittees. There wasn't enough pressure on either side of the Capitol to force legislation.

**Drive for Change . . .** But new life is due to be pumped into the drive for corrective action early next year. Sen. Homer Capehart, R., Ind., and Rep. Chauncey W. Reed, R., Ill., plan to spearhead drives for action that will allow mills to absorb freight, meet competition from mills located closer to customers.

**Boost Gas Rates? . . .** Prospect of higher natural gas rates is

building up at Federal Power Commission.

Before the Eisenhower Administration took office, FPC officials held the view that natural gas companies were entitled to a return of between 5.5 pct and 6 pct. Recently, however, FPC authorized United Fuel Gas Co. a 6.25 pct rate of return and approved a \$10 million annual rate increase for the company.

**What's Fair? . . .** Gas companies have blamed many of their difficulties on the previous FPC concept of "fair return." They lacked funds to expand plant and equipment, finance new operations. But the commission now says in the United case that only a "fair and reasonable" 6.25 pct return will permit the company to enlarge its service facilities.

#### Used Car Boom?

It's getting so you can't figure the importance of a Washington official's job by the size and cost of the car he uses.

Treasury Secretary George Humphrey, for example, rates a limousine and chauffeur, but even for official business travel he's driving his own 2-door sedan.

Participating in a similar economy drive is Small Business Administration Chief William D. Mitchell. Congress voted Mr. Mitchell \$1400 for a new auto, but he bought a government surplus car for \$346.95 and turned over the balance to the Treasury.

These money-saving actions were considered so noteworthy that two Republican Congressmen, Frank T. Bow of Ohio and Oakley Hunter of California, are reporting the news to their constituents.

Significance of the United ruling lies in the strong possibility that future FPC rate decisions may revolve around the 6.25 pct return figure as reasonable, rather than the previous 6 pct figure. Immediate result: A compensating increase in rates to both industrial and household consumers.

**More to Spend . . .** The buying public is to have about \$1.3 billion in additional spending power by June 1954, if Congress sticks to its present timetable of scheduled reductions in individual and excise tax rates.

Government economists believe consumers are prepared to spend a substantial part of these tax savings in retail markets. Of the estimated \$1.3 billion revenue loss to the government, about \$1.1 billion will be retained by individual income taxpayers, and about \$200 million by buyers of products subject to federal excises.

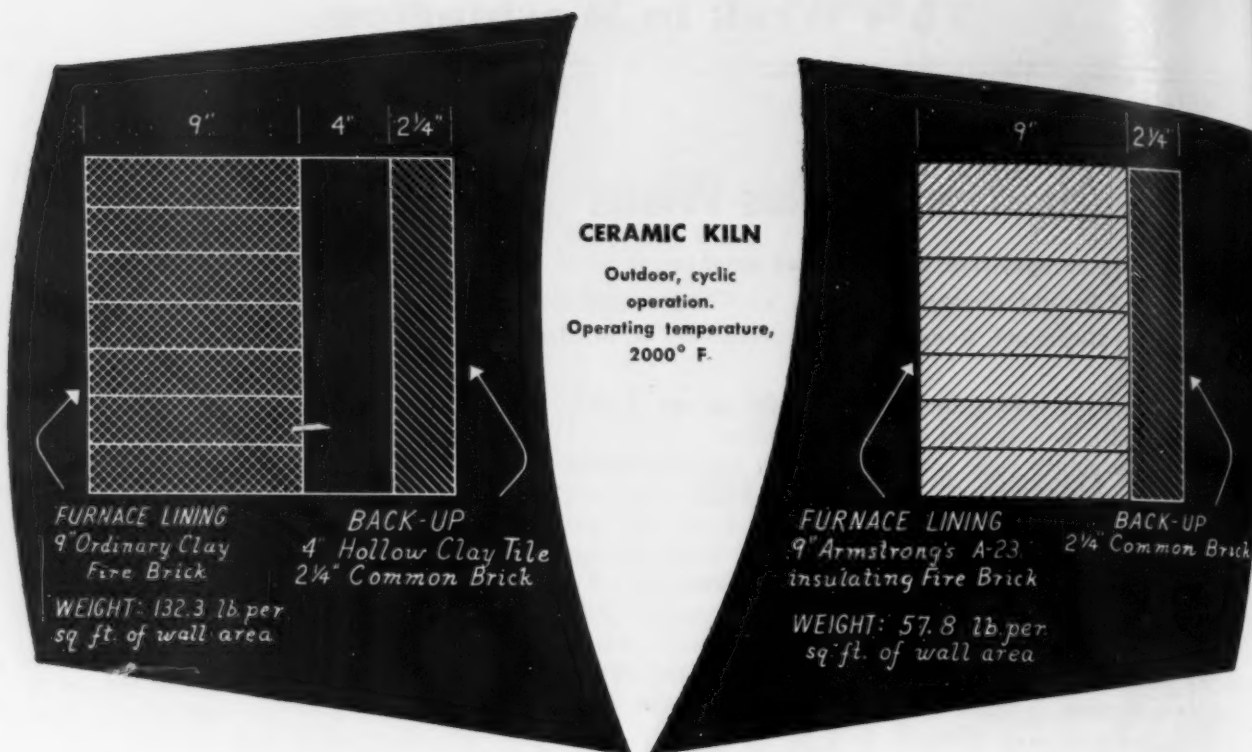
**What They'll Cut . . .** Individual income taxes are due for a cut of about 10 pct next Dec. 31. Excises on such products as liquor and tobacco are to be reduced. Rates on some household appliances may be trimmed, but a final decision won't be reached until next year.

Many congressmen believe the time is near at hand for voting relief to new business firms. New companies are especially hard hit by existing tax laws. They find it almost impossible to retain sufficient earnings after taxes to finance normal expansion.

Capitol tax experts are planning to turn out a realistic and equitable new tax program next year. Reduced rates, ending of provisions that stifle initiative, and the closing of existing "loopholes" are to be included in the new recommendations.

**Inventory Rate Slows . . .** A slowdown in the rate of inventory building is reported by Commerce Dept., which estimates July stock





## Which furnace wall cut heat losses by 37%

Here's how a simple change in wall construction made a big difference in the performance of an outdoor ceramic kiln. The wall on the left consisted of ordinary clay fire brick backed up with hollow clay tile and common brick. With this construction, heat loss ran 710 BTU's per square foot per hour, while the excessive thickness and density of the materials saddled the kiln with a heat storage of 46,360 BTU's per square foot.

Now look at the improvement in these figures when the wall was rebuilt as shown at the right. Here, with the fire brick and hollow clay tile replaced by 9" of Armstrong's A-23 Insulating Fire Brick, heat loss dropped 37% to only 450 BTU's per square foot per hour.

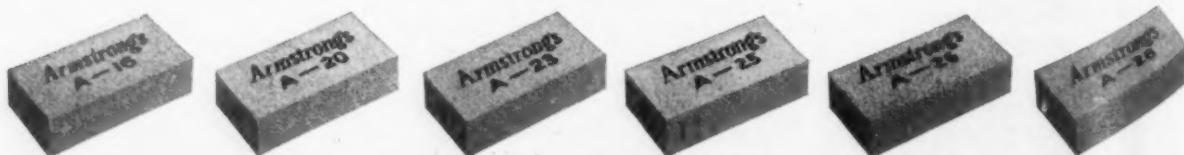
The lesser weight of the new, thinner construction also cut the heat storage to 12,100 BTU's per square foot of wall area—a decrease of ap-

proximately 75% from the original rating of 46,360.

While low heat loss and heat storage always mean more economical utilization of fuel, they are particularly important in a periodically operated furnace or kiln such as this. Shorter heat-up time means faster operating cycles, more production.

### Do you have a furnace problem?

Choosing the right insulating fire brick calls for a sound knowledge of brick performance and furnace construction. That's why it's a good idea to call on the Armstrong engineer whenever you have a furnace problem. He'll study your conditions and help you select the best brick for your particular job. To have him help you, just call your near-by Armstrong office or write to Armstrong Cork Company, 2709 Susquehanna Street, Lancaster, Pennsylvania.



## ARMSTRONG'S INSULATING REFRACTORIES

levels at \$77 billion—not much changed from June.

However, since inventories normally decline in July, the seasonally adjusted book value of stocks on hand rose \$600 million.

July business sales were reported at nearly \$48 billion—down \$1 billion from June. But after seasonal adjustment, sales stood at a record level and up one-half billion from June.

A substantial portion of the increase in inventories at all levels was attributed to rising stocks of motor vehicles, especially those in dealers hands.

## Durkin:

### Exit portends all-out union attack on Taft-Hartley Law.

Labor leaders are girding for an all-out attack next January on the Taft-Hartley Law. As a result of the resignation of Martin P. Durkin last week from the Eisenhower cabinet, union officials now believe they are no longer under any obligation to "Marty" to hold their peace on proposed revisions to Taft-Hartley.

Mr. Durkin sought—and was refused—White House backing on 19 proposed amendments to the labor law. Not one of the 19 amendments was entirely unacceptable to management representatives attending the Taft-Hartley conferences, but as a "package," the amendments had the effect of substantially undermining the Taft-Hartley Law.

### Won't Buy Package

Among the changes sought by Mr. Durkin—and endorsed by organized labor—are the elimination of the non-communist oath required of union officials, dilution of the ban on secondary boycotts, and approval for unions and employers to enter pre-hiring contracts in certain industries before work is started.

A principal stumbling block in the road was Mr. Durkin's proposal to end the Taft-Hartley provision permitting the states to outlaw the union shop even though federal law

permits it. As the White House sees it, this is in conflict with its drive for more state control and less federal control in labor and other national issues.

## Surveys:

### Census Bureau cuts costs by improved business sampling.

U. S. Census Bureau is out to save the taxpayer money by improving the collecting and processing procedures for its business surveys.

Private groups, including trade associations, are already helping the Census Bureau trim its costs by assuming all or part of the costs of some commodity studies.

To stay within the limits of funds appropriated by Congress, the Census Bureau has cut from its program the 1953 Censuses of Business and Manufactures and preparatory work on the 1954 Census of Agriculture. Requested for these functions was \$11.6 million, but Congress held down the appropriation to \$1.5 million. With this smaller amount, the Bureau expects to make progress in:

1. Improving sampling procedures needed for determining the national retail trade volume.
2. Expanding retail trade statistics to provide more detailed monthly figures by type of business, plus regional breakdowns of sales by major businesses.
3. Broadening wholesale trade statistics.
4. Instituting a sample survey

of selected service trades.

5. Continuing the annual sample survey of manufactures, especially emphasizing activities among metal-consuming industries.

6. Tabulating and publishing data for each U. S. county, showing number of business houses, total employment, and first quarter 1953 payrolls.

7. Conducting a two-state sample survey to provide state estimates and test methods which may help Agriculture Dept. strengthen its current statistics.

## Military:

### May not meet budget goal for cutbacks in service personnel

There is currently considerable doubt as to whether the military will be able to reduce its ranks to the levels called for in new Defense Dept. budget without losing thousands of its best trained specialists and technicians.

Goals set in the fiscal '54 Defense Dept. budget would have lowered the number of persons in uniform from 3.5 million in mid-1953 to 3.35 million by next July 1, even without a cessation of the fighting in Korea. Another 50,000 were to be dropped from the services if the Korean hostilities came to a permanent end.

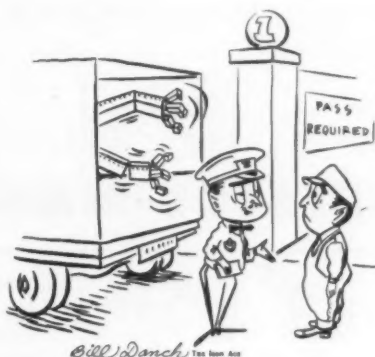
There is little likelihood that prescribed manpower goal will be reached by July 1, some sources indicate. Such an action would require the recall of thousands of men from either the Far East or Europe—both critical areas.

## Car Builders Still Sweating

Deliveries of new freight cars in August amounted to 5557, below July shipments but 120 more than for the same month 1952, reports Association of American Railroads.

Railroads stepped up new orders during August, contracting for 3913 units, the largest number for any month since January.

Car building backlog continued a slow decline, standing at 45,735 as of Sept. 1.



"I don't want to hear another word about this robot nonsense."

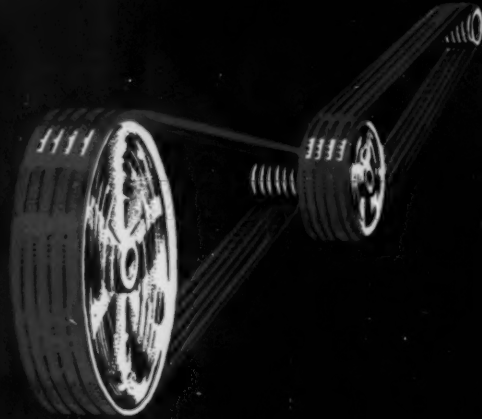
*Condor V-Belts—More use per dollar*

*Condor V-Belts—More use per dollar*

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*Condor V-Belts—More use per dollar*

*Condor V-Belts—More use per dollar*



**SMOOTHEST RUNNING V-BELTS MADE . . .** The result—long life and low V-belt drive costs. Correct engineering makes the difference. Sidewalls are *straight* for more grip, less slip, longer life. The pulling section is micro-positioned. Every Condor V-Belt is correctly balanced and destretched during manufacture. This, too, means longer life. Also in special oil-, heat-, static-resisting types . . . Get the engineering facts. Ask the R/M Distributor for Bulletin 6868 . . . He'll show how you also can get **MORE USE PER DOLLAR** with R/M hose, transmission and conveyor belts.



MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

**RAYBESTOS-MANHATTAN, INC.**



Flat Belts



V-Belts



Conveyor Belts



Hose



Roll Covering



Tank Lining



Abrasive Wheels

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Teflon Products • Packings • Sintered Metal Parts • Bowling Balls

MR 902



## West Coast Report

### Easing Demand Pinches Smaller Mills

**Market for re-bars, light structurals, softens . . . Some mills down to 75 pct of capacity . . . Scrap scuttled . . . But overall demand stays high . . . Large mills unhurt—By T. M. Rohan.**

Major gaps in the market for smaller western steel mills were becoming increasingly apparent last week.

Larger producers of flat-rolled products continued near capacity production and the overall ingot rate remained high. But in reinforcing bars and light structurals, the historic overcapacity was becoming more apparent.

One large Los Angeles area mill this week goes on a 5-day week after keeping one furnace in intermittent production for several weeks. Some mills were down to 75 pct production. The scrap market, lowest in U. S., has about hit rock bottom on the West Coast. Building contractors reported more bids than ever before with no more than 7 to 8 pct spread between high and low.

**Ask Freight Cut . . .** Wire products, nuts and bolts and small re-bars brought forth the traditional salesman's lament of "they're running out our ears." Some sheet products were being overshipped by western producers and eastern mills were renewing pressure for western markets.

An application by Colorado Fuel & Iron Corp. for lower freight rates on wire products made to the Trans Continental Freight Bureau in Chicago in August was being eagerly watched and prompted a host of supplementary requests from other producers.

For biggest mills, overall output remains high. But filling all books on specific products was no easy task.

Tightest items remained tinplate, eastern-made large carbon bars, plates and wide flange beams. Pipe and sheet are loosening perceptibly. All agree the

cream is definitely off the market. A return to prewar levels is awaited.

**Copper Slowdown . . .** Kennecott Copper Co.s' \$50-million, 16,000-ton-per-month refinery at Garfield, Utah, last week was ready for a full shutdown. Reduced to 10 pct of normal output, only 83 maintenance men of the regular 600 work crew were to be kept on the job after Sept. 13.

Forced layoff makes workers eligible for unemployment compensation. Coupled with a softening copper demand, a long walk-out appears sure, unlike last year's strike of a few days.

**Mines Keep Going . . .** Mine output continues uninterrupted, two-thirds going to the neighboring American Smelting and Refining Co. smelter and the remainder to Baltimore, currently farming out smelting and refining among eastern plants. Although the slowdown started Aug. 24, negotiations for 16.5¢ per hour increase started only last week when federal conciliators were called in.



Major hurdle is a 4.2¢ differential previously existing favoring United Steelworkers over the independent International Union of Mine, Mill and Smelter Workers. Steelworkers currently want the differential continued.

**Tax Exempt . . .** Eastern manufacturers as well as tourists are hitting the jackpot in Reno. Under a Nevada "free port" law enacted in 1949, manufacturers can store products there tax free for out-of-state sale. California, the major market, gets a personal property tax.

Last week a San Francisco realty firm announced purchase of a 50-acre tract in Sparks, Nev., adjoining Reno, for erection of an 800,000-sq-ft warehouse and industrial development. Strategically situated at a juncture of the Southern and Western Pacific railroads and U. S. Highway 40, warehousing for shipment into California and northern points has grown to about 75,000 sq ft divided between five firms.

**Bethlehem Buys . . .** Purchase of 47 acres of land in heavily industrialized Torrance, Calif., near Los Angeles, was announced last week by Bethlehem Pacific Coast Steel Corp. The tract is located about 15 miles from Bethlehem's present tightly-packed mill at Vernon, Calif. Erection of a fabrication plant on the new site is probable.

**Kaiser Plans Expansion . . .** With a new fast tax writeoff in hand, expansion talk was renewed by Kaiser last week. The writeoff, requested a year ago, applied to a proposed \$52 million expansion of plate and tinplate production facilities on which 40 to 65 pct was allowed.

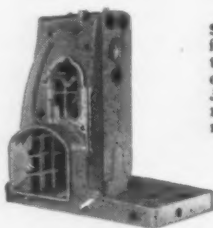
Still only in the discussion stage, first expansion will probably go into the electrolytic tinplate line to raise output from current 130,000 annual tons. Plate may be second priority project.



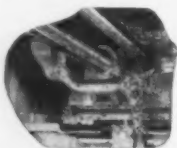
# CH MILLING MACHINE COMBINES SPEED, ACCURACY AND POWER



## CH MILLING MACHINE FEATURES THAT HELPED DO THIS JOB BETTER



**Greater rigidity —** Heavily ribbed, box section, sponson construction. Proper weight distribution absorbs vibration.



**Smoother feed performance** through a heavy duty 2" dia. table feed screw. 23% greater bearing contact between screw nut for longer screw life and accuracy.



**Speeds and Feeds—24** speed changes from 15 to 1500 rpm. Automatic protecto-mesh mechanism permits non-clash shifting during speed changes. 32 changes from  $\frac{3}{4}$ " to 90" per minute meet requirements of new metals and cutting tools.



**Greater cutting efficiency** through a train of heavy duty, wide-faced, forged steel gears, hardened and specially processed.



**Greater horsepower —** independent drives for spindle, feed and rapid traverse, and coolant. 15 hp to spindle . . . 3 hp for feed and rapid traverse . . .  $\frac{3}{4}$  hp for coolant.

## Here's a job handled on a new CH-4 Machine

**Job:** Menasco Mfg. Co., Burbank, Cal. Straddle Milling Drag Links

**Machine:** No. 4, Model CH, Plain Style

**Part:** Shock strut for landing gear cylinder

**Cutter:** High speed steel inserted tooth

**Cutter Speed:** 18 rpm, 15/32 ipm feed

**Chip Load:** .005"

**Material:** 4140 Steel forging, 43 Rockwell

Investigate the new CH line of milling machines. These and other features are job proven to give you cost-cutting results plus greater productivity, better finished products. Contact our nearest representative or write: Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.



## Machine Tool High Spots

### '54 Tough for Mill Equipment Makers

**End of steel industry's expansion means 1954 will be a year of stiff competition for steel mill equipment manufacturers . . . Backlogs dropping—By E. C. Beaudet.**

Builders of steel mill equipment are leveling their sights on 1954 as a year of more intense competition. With the steel industry's expansion program near completion, future business will be hard to come by.

Most steel mill equipment manufacturers report business this year down from 1952, but they still believe 1953 will be a good year. However, many of the orders now bolstering order books represent the end of the steel industry's expansion.

**Cutbacks Hurt . . .** One large steel mill equipment builder entered the year with 12-months' work on the books. This has now slipped to 8-9 months. Part of the dropoff is attributed to the cutback in the Air Force heavy press program.

One company which makes a wide range of equipment reports sales are down 60 to 70 pct from the average of the last 3 to 4 years. Backlogs, dropping at the rate of 1/3 of a month per month, have sunk from 16 months to 12 months.

**Demand Shifts . . .** One factor coloring present and future sales prospects is the change in steel company buying patterns. When demand for equipment was at its strongest during the post-war expansion program, the emphasis was on equipment for melt shops and rolling facilities. Emphasis has now shifted to auxiliary units.

Going along with the steel producers, manufacturers of rolling mill equipment expanded considerably during the postwar period to meet with the terrific demand. Now they are in a better position than ever before from a capacity standpoint which may lead to some

tough competition in the future and should keep prices down.

One possible source of increased new business lies in the foreign market. American equipment builders are now vigorously strengthening their efforts in this direction to meet competition, particularly from West European builders.

**Reds Interested . . .** A sidelight on the recently held European Machine Tool Show at Brussels, Belgium, is the interest shown by Iron Curtain countries in the exhibition. Reports from Europe indicate that representatives from Russia, Czechoslovakia, Poland and Hungary had requested permission to participate.

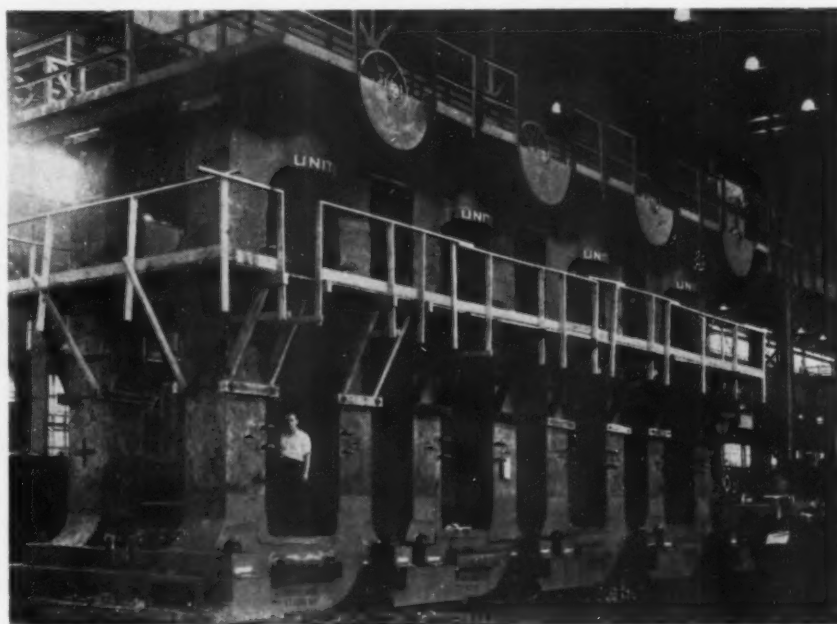
The late date of the request, coupled with the fact that all space had been already sold made their entry impossible. However, it is reported that Iron Curtain

firms will participate in the Machine Tool Show at Milan, Italy, in 1954.

**Automatic Gaging . . .** Increasing inspection costs are focusing greater attention on automatic gaging of parts and processes. The trend to automatic gaging is also being furthered by the greater accuracy of precision-machined parts and the desire to eliminate tedious and time-consuming gaging now done by operators.

Now more and more firms are looking for gages which will speed inspection, cut costs and eliminate operator fatigue. Greater emphasis is being made on gaging which is built right into the machine to become an integral part of the production line.

**Issue Certificates . . .** Certificates of necessity for accelerated tax amortization for several machine tool builders were recently issued by the Office of Defense Mobilization. These include: Jones & Lamson Machine Co., \$494,213; The Baird Machine Co., \$386,000; Consolidated Machine Tool Corp., \$2 million, and Smith-Harris Machine Co., \$49,800.



**NEARING COMPLETION** at United Engineering & Foundry Co.'s plant is a new 56-in., 4-stand cold mill. Mill equipment makers expect stiffer competition during 1954.



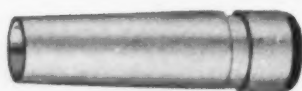
## What's in it for you



Before you buy your next multiple spindle automatic bar machine it will pay to ask your Cone Representative about the Conomatic Carbide Development program. He will be glad to tell you what's in it for you.

Among the things that your Representative can tell you is how you can be sure that any brand of "automatic", that you may have under consideration, will be equipped to get the most from any modern tool material, including 100% carbide tipped tool applications.

The part illustrated is from regular production runs with HSS and 100% carbide tipped tools. Full particulars are available.



**MATERIAL—COPPER:** Hole drilled with  $\frac{1}{2}$ " dia. drill to 3" depth; taper formed on OD.

	HSS	CARBIDE
Cycle Time	45 secs.	16 secs.
Work Spindle Speed	670 R.P.M. at 110 S.F.	2026 R.P.M. at 398 S.F.
Tool Wear	150 pcs. per grind	2500 pcs. per grind



# Conomatic}

CONE AUTOMATIC  
MACHINE COMPANY, INC.  
WINDSOR, VT., U.S.A.

# REPORT TO MANAGEMENT...

Pick your tariff stand

Gage your productive position, your market, then take your tariff stand. (1) Ultra-mechanized mass producers able to off-set cheap foreign labor will champion Free Trade, seek broader access to export markets and unencumbered imports of raw materials. (2) Those who find it impossible to mechanize sufficiently to compete with overseas labor will want tariff safety here and ignore substantial exports as unattainable.

You'll find change difficult

Whatever your tariff desires don't expect any special support from the President's top level committee now studying the possible course of America's trade policies. U. S. tariff practice is not likely to detour radically from its established path of leniency. Neck-deep in international politics, we have meanwhile been wedded to reliance on exports of finished goods, imports of industrial raw materials.

Tariff wall too high?

Do you believe our tariff wall is too high? Previous Administrations have used a battering ram on it. From 1930-33, average ad valorem tariff rate on dutiable imports was 52.8 pct, on free and dutiable combined, 17.7 pct. In '52 the rate was 12 to 13 pct on dutiable goods, about 5 pct on free and dutiable. Marginal leeway remains for concessions to severely distressed industries but even these will be impeded by threat of retaliatory tariffs hurtful to others.

European walls to continue

Dollar-poor Europeans will continue carping against our tariffs and the Buy American Act, with principal pressure coming from manufacturing nations. Yet, Europeans are for Free Trade only to a certain point of self-advantage and in the long term may be its most bitter opponents. Fearing U. S. economic domination, they won't willingly unleash the American productive juggernaut into an unrestricted marketplace.

Our dynamic tariff influence

Beclouding the tariff issue today is our political wish to stand Europe on its own financial feet. But most dynamic tariff influence remains the need of major home industries to export, import. First half '53 volume of U. S. imports rose to peak levels, besting '52.

How trade is changing

In 1920, highest export-import year unsurpassed until 1942, we exported \$8 billion in finished goods, over \$5 billion in foodstuffs, \$2.2 billion in crude materials, semi-manufactures. Today we are exporting about \$15 billion of finished goods, \$6 billion of foodstuffs, and \$4 billion in crude materials, semi-manufactures. With U. S. manufacturing ascendancy, finished product exports continued surging up. America's stake in finished exports can be further proved: 1936-40 average exports of machinery, vehicles were \$912 million, climbed to \$4.7 billion by 1951.

We can trade with Europe

Pointing up massive U. S. industrialization, imports of crude materials, semi-manufactures in 1920 were about \$2.5 billion, rose to almost \$6 billion by 1951. Interplay of trade even among highly mechanized areas also tends to show an increase. U. S. imports of finished goods climbed from about \$5 billion in 1920 to over \$10 billion in '51.

U. S., Europe butt competitive heads

Since 1870 America has shown an excess of exports over imports, yielding a favorable, profitable balance of trade. In 1951, exports excess was \$4 billion, recovering from 1950's low \$1.4 billion when shortage buying slimmed the gap. With industrial plants of Europe, America expanded, world-wide competition will thrive--especially since both areas now need more than home markets. You have a lot to sell the world--if you go out and sell it.



Like the works of a fine watch . . .

**STEELMAKING, TOO, REQUIRES  
THE UTMOST PRECISION**

Whatever your requirements for formability, uniformity, or drawing qualities, you'll find J&L Sheet & Strip . . . accurately and faithfully produced to meet your specifications. Complete understanding of the end-use of the sheet or strip you order is a rigid requirement of J&L production. You can depend upon J&L products to fit your production line.



**JONES & LAUGHLIN STEEL CORPORATION**  
PITTSBURGH

**J&L  
SHEET  
AND STRIP  
STEEL**





# seamless tube mills

GOOD  
EQUIPMENT  
BRINGS  
DOWN  
PRODUCTION  
COSTS

When a company considers an investment of the size and scope of a seamless tube mill, they can only consider a manufacturer which has facilities, experience, integrity and financial stability. The name Aetna-Standard appears in the majority of the world's tube producers today. Recent installations include two mills for sizes 2½" to 9½" to produce oil country and mechanical tubing; three (assei type) for production of bearing tubing. Aetna makes mills to produce seamless tubing in lengths of 50 feet and a complete diameter range between 1½" to 26".



THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

## Aetna-Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

### ASSOCIATED COMPANIES

Hand Wrightson Machine Company, Ltd., Middlesbrough, England — Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.  
Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.  
M. Castellvi, Inc., New York, N. Y. — Mexico, Central and South America.  
Société de Constructions de Montbard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.  
Demag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.  
Compagnia Italiana Ferme Acciaio, Milano, Italy — Italy.  
Aetna-Japan Company, Ltd., Tokyo, Japan — Japan.  
Walt & Kullgren, Inc., Akron, Ohio — Representative for the Rubber Industry.

*Designers and Builders to the Ferrous,  
Non-Ferrous, Leather, Rubber, and Plastic Industries*



**PENINSULAR GRINDING WHEEL CO.**  
**saves time and labor, does a better job with**  
**FARQUHAR**  
**Hydraulic Press**

Five years ago, the Peninsular Grinding Wheel Company, Detroit, Michigan, installed a hydraulic press. Peninsular wanted a press that could mold grinding wheels quickly and well—with a minimum of rejects, that would stand up for many hours of constant use—so it chose Farquhar. And Farquhar does the job! In operation 16 hours a day, 5 days a week, this 300-ton model works smoothly and satisfactorily, cutting time and labor costs. Peninsular particularly likes Farquhar's easy pressure setting and the short ram stroke required—two of the many Farquhar features that contribute to its dependable, money-saving performance.

**Farquhar Presses Cut Your Costs**  
 Just one more example of cost-cutting

Farquhar performance in modern production. Farquhar Presses are built for the job . . . assure faster production due to rapid advance and return of the ram . . . greater accuracy because of the extra guides on moving platen . . . easy, smooth operation with finger-tip controls . . . longer life due to positive control of speed and pressure on the die . . . long, dependable service with minimum maintenance cost.

Farquhar engineers are ready to help solve whatever production problem you may have. Give them a call. Send for free catalog showing Farquhar Hydraulic Presses in all sizes and capacities for all types of industry. Write to: **THE OLIVER CORPORATION, A. B. Farquhar Division, Hydraulic Press Dept., 1503 Duke St., York, Pa.**



**THE OLIVER CORPORATION • A. B. FARQUHAR DIVISION**

**Free Publications**  
*Continued*

**Resistance testing**

Information on the Miniature Multitester combination volt-ohm meter for testing resistances and ac or dc voltages is contained in a new data sheet. Small in size and weighing only 12 lb, this unit was designed for electronic equipment servicemen to use in the field. It has four dc voltage ranges reading to 300 v, four ac voltage ranges reading to 600 v, and four resistance ranges reading to 2 million ohms. Special dial and range modifications are available at nominal cost even in small quantities. *International Instruments, Inc.*

For free copy circle No. 12 on postcard, p. 127.

**Flask-lift machines**

Tabor Bulletin No. 531 describes the company's complete line of flask-lift machines in foundry applications. Information includes complete specifications and capacities for jar flask-lift, plain squeeze flask-lift and jar squeeze flask-lift machines. The publication contains many photographs and diagrams. *The Tabor Mfg. Co.*

For free copy circle No. 13 on postcard, p. 127.

**Fasteners**

Fastenings of high temperature and corrosion resistant alloys are the subject of a new brochure put out by The H. M. Harper Co. Among the alloys covered are Refractaloy, A-286, Hastelloy alloys, Inconel, Discaloy, 19-9DL, Greek Ascacloy, titanium and stainless steels. Tables of nominal mechanical properties of the various alloys are included. *The H. M. Harper Co.*

For free copy circle No. 14 on postcard, p. 127.

**Bearing catalog**

Complete listing of The Bunting Brass & Bronze Co.'s industrial standard stock bearings, bars and electric motor bearings is contained in a 64-p. pocket catalog. This handy-size publication has all the bronze bearing information contained in the company's larger, full-size catalog. *The Bunting Brass & Bronze Co.*

For free copy circle No. 15 on postcard, p. 127.

# DO YOU KNOW WHAT HEAT TREATING COSTS When You Do Your Own?

If you now do your own heat treating—or are contemplating the installation of a heat treating department—have you carefully considered all of the costs involved?

Each of the following factors must be given careful consideration:

## LABOR



Trained operators require years of experience, without them you cannot expect satisfactory heat treating. Can you afford men of this caliber for the amount of heat treating you require?

## SUPPLIES



Gas, electricity, chemicals—an endless variety of materials are needed continually. Are you wasting money due to insufficient work to keep all equipment going? Closing down and re-heating furnaces is an expensive waste.

## PLANT SPACE



Does your present department have enough space to work efficiently? If planning a new department, will it require an addition to your plant?



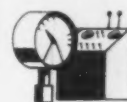
Can you economically install sufficient equipment to handle all of your requirements for hardening, annealing, carburizing, nitriding, etc., or can your present equipment handle all these operations with successful results? Is your capacity flexible enough to handle peak loads?

## MAINTENANCE



Equipment must be kept in constant repair to prevent rapid deterioration. What does it cost you or what will it cost you?

## TESTING EQUIPMENT



A constant check on heat treating operations and results is required to maintain quality and uniformity. Add this to the cost of your equipment along with skilled operators.

## INSURANCE



What has the installation of a heat treating department done to your insurance rates? What can you expect if you are planning a new department?

## EQUIPMENT

These are the major items to be figured into the cost of your own heat treating department—there are others which arise in special cases.

The problems listed here have been faced and

overcome by commercial heat treaters. They know the answers because heat treating is their business—just as the manufacture of your products consists of solving numerous problems in your business.

## There's a Heat Treating Specialist Near Your Plant

### Ace Heat Treating Company

Elizabeth, New Jersey  
Anderson Steel Treating Co.

Detroit, Michigan  
Benedict-Miller, Inc.

Lyndhurst, New Jersey  
California-Doran Heat Treating Co.

Los Angeles 23, California  
Commercial Metal Treating, Inc.

Bridgeport, Conn.  
Commercial Steel Treating Corp.

Detroit 4, Michigan  
Cook Heat Treating Co. of Texas

Houston 11, Texas  
The Dayton Forging & Heat Treating Co.

Dayton 3, Ohio  
The Drever Company

Philadelphia 33, Pennsylvania  
Greenman Steel Treating Company

Worcester 5, Massachusetts  
Fred Heinzelman & Sons

New York 12, New York  
Alfred Heller Heat Treating Co.

New York 7, New York  
Hollywood Heat Treating Co.

Los Angeles 38, California  
Industrial Steel Treating Co.

Oakland 8, California



### L-R Heat Treating Company

Newark, New Jersey  
The Lakeside Steel Improvement Co.

Cleveland 14, Ohio  
Metal Treating, Inc.

Milwaukee 4, Wisconsin  
Metallurgical Control Labs.

Minneapolis 7, Minnesota  
Metallurgical, Inc.

Kansas City 8, Missouri  
Metlab Company

Philadelphia 18, Pennsylvania

This advertisement sponsored by  
these Companies which are mem-  
bers of the Metal Treating Institute

### Metro Heat Treating Corp.

New York 13, New York  
O. T. Muehlemyer Heat Treating Co.

Rockford, Illinois  
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South Bend, Indiana  
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Pittsburgh Commercial Heat Treating Co.

Pittsburgh 1, Pennsylvania  
The Queen City Steel Treating Co.

Cincinnati 25, Ohio  
Reliable Metallurgical Service, Inc.

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Syracuse Heat Treating Corp.

Syracuse, New York  
Vincent Steel Process Co.

Detroit, Michigan  
Winton Heat Treating Company

Cleveland 16, Ohio



# NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 127 or 128.



## Heavy duty drilling and tapping machines

A line of heavy-duty drilling and tapping machines are equipped with electrically controlled air-powered thrust. Two models are produced, both as box column, floor-stand type, having sliding head and adjustable work table and as bench and table multiple unit combinations having two, three or four head units. Model C-16-T puts relatively short-run jobs into the high production class because of the ability to drill parts and tap them from the same fixture. This unit performs single and multiple

tapping direct from the drill chuck or standard multiple drill head, without employing a clutch or lead screw. Precise control of the air thrust at low pressures provides sensitive tapping action which permits the tap to provide its own lead and reproduce a thread with maximum fidelity to the ground tap. Maximum thrust of 980 lb at 100 psi is obtainable on both models and length of stroke is 4 in. Drilling capacity is  $\frac{3}{4}$  in. in mild steel. *Beckett-Harcum Co., Inc.*

For more data circle No. 16 on postcard, p. 127.

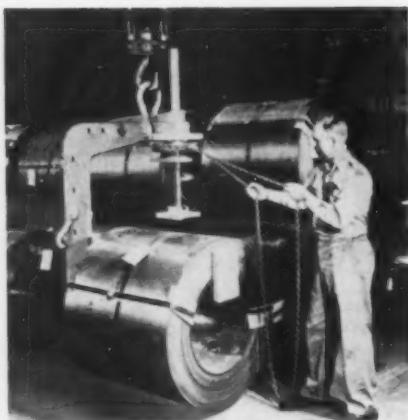


## Tilt-head grinder has refrigerated surface plate

Two features of a new grinder are a table which stays horizontal while the grinder tilts to 30° open or 30° closed grinding position, and a refrigerated surface plate of 210 sq in. to keep the material cool while grinding. The tilt angle of the grinding belt can be changed during the grinding operation through knee-pad controls. In addition to continuous change of tilt,

the machine has an auto-stop device which permits change of tilt in graduations of  $\frac{1}{2}^\circ$  for each press of knee-pad control. An exhaust system acts within the grinder to pull all grit into a Dust-Kop or container unit. A 5 hp U. S. motor gives the grinding belt a surface speed of 4500 fpm. *Sierra Machinery Co., Inc.*

For more data circle No. 17 on postcard, p. 127.



## Coil handler lifts and turns 48 in. wide coils

New coil handler was designed to pick up, turn, transport or stack large, heavy coils. It is mainly used for picking up coils set either horizontal or vertical, and will turn the coil 90° as the crane lifts. After the unit is placed on the coil, the pressure shoe is adjusted to the coil radial thickness. It has a floating action to allow full bearing on the outer diameter of the coil. Concave surface on the shoe allows

maximum clamping surface. The inner support arm has a contour surface  $4\frac{1}{2}$  in. wide, the full length of the arm; distributes the load over a greater area. Width capacity is 24 in. up to 48 in. Inside diameter to outside diameter ranges from 10 to 16 in. Coil-handler capacity is 15,000 lb. *Dixon Automatic Tool, Inc.*

For more data circle No. 18 on postcard, p. 127.

Turn Page

for mass production  
...or...custom fabrication--

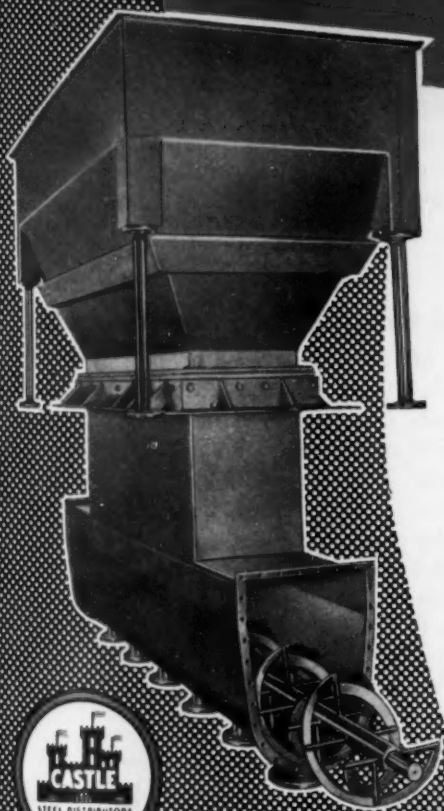
# Castle

supplies all types of

## STAINLESS STEEL

to large and small customers

--from coast to coast



Imagine--1520 gallons of Pepsodent Tooth Paste! That's the capacity of the mammoth tooth paste hopper pictured on the left. This unusual unit was made for the Pepsodent Division of Lever Bros. Co. It was custom built to meet their exacting specifications by Alloy Crafts Company of Chicago--famous fabricators of stainless steel. And, all the stainless steel was supplied by--A. M. Castle & Co.

### Castle Has--EVERYTHING In Stainless Steel

This case is typical of the many in which Castle supplies all kinds of stainless steel to customers large and small--for custom fabrication or mass production. If you need stainless steel--sheets, plates, flats, angles, rounds, squares, hexes...in any standard grade or finish...or...anything special--Castle can supply you with whatever you want--by the pound or by the carload.

In fact--with nine large, heavily stocked, fully equipped warehouses from coast to coast--Castle can furnish you with EVERYTHING in steel. And like thousands of others you'll like the fast, friendly, intelligent service that is a tradition with this 61 year old organization--one of the largest independent steel distributors in the United States. Why not phone--A. M. Castle & Co.--right now? No obligation, of course.



EVERYTHING IN STEEL

COLD FINISHED BARS • STAINLESS STEELS  
HOT ROLLED BARS • TOOL STEELS • ALLOY STEELS  
SHEETS • PLATES • STRUCTURAL and many others  
In a large variety of sizes, grades, and  
finishes--for immediate delivery.

*from coast to coast*

# A. M. CASTLE & Co.

## STEEL DISTRIBUTORS

BALTIMORE • CHICAGO • MILWAUKEE • ROCKFORD • KANSAS CITY • SEATTLE • SAN FRANCISCO • BAKERSFIELD • LOS ANGELES

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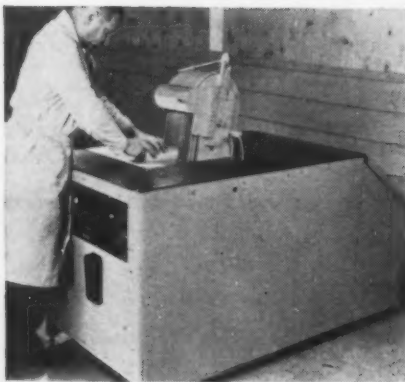


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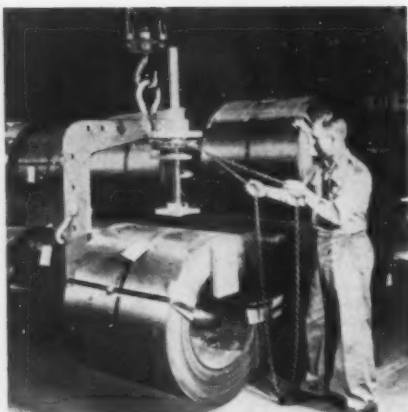


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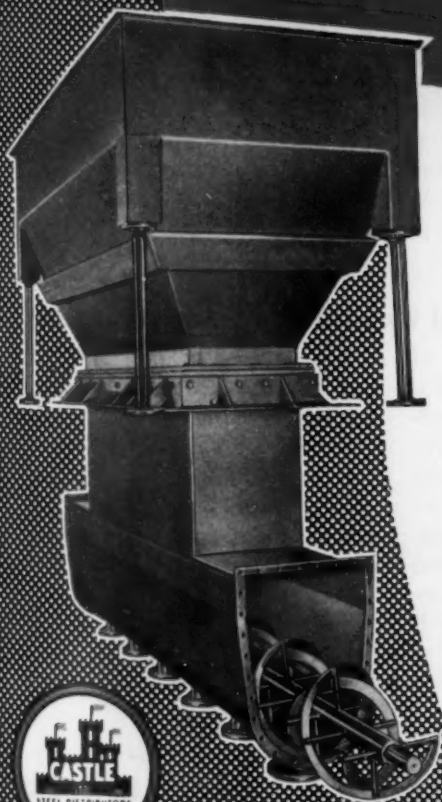
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### Castle Has--EVERYTHING In Stainless Steel

This case is typical of the many in which Castle supplies all kinds of stainless steel to customers large and small--for custom fabrication or mass production. If you need stainless steel--sheets, plates, flats, angles, rounds, squares, hexes...in any standard grade or finish...or...anything special--Castle can supply you with whatever you want--by the pound or by the carload.

In fact--with nine large, heavily stocked, fully equipped warehouses from coast to coast--Castle can furnish you with EVERYTHING in steel. And like thousands of others you'll like the fast, friendly, intelligent service that is a tradition with this 61 year old organization--one of the largest independent steel distributors in the United States. Why not phone--A. M. Castle & Co.--right now? No obligation, of course.



EVERYTHING IN STEEL

COLD FINISHED BARS • STAINLESS STEELS  
HOT ROLLED BARS • TOOL STEELS • ALLOY STEELS  
SHEETS • PLATES • STRUCTURAL and many others  
In a large variety of sizes, grades, and  
finishes--for immediate delivery.

from coast to coast

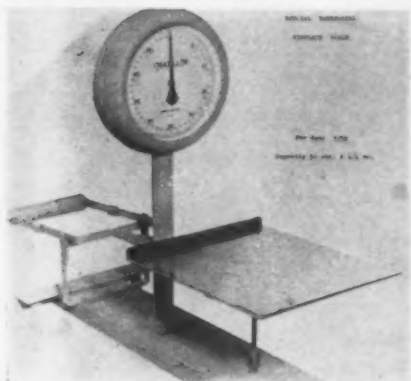
# A. M. CASTLE & Co.

## STEEL DISTRIBUTORS

BALTIMORE • CHICAGO • MILWAUKEE • ROCKFORD • VANAL CITY • SEATTLE • SAN FRANCISCO • BIRMGHE • LOS ANGELES

## New Equipment

Continued

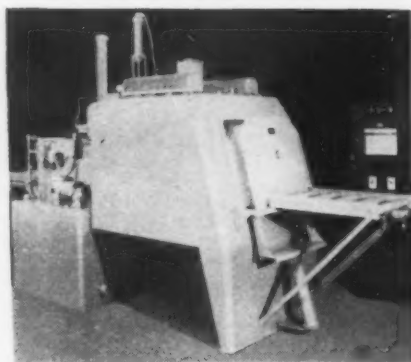


### Scale weighs large sheets of tinplate

Thermoseal tinplate scale was developed for use with relatively large pieces of material of relatively low weight—in this case for accurate weighing of large sheets of tinplate. The thickness of tinplate is measured by a comparison of the weight of steel sheets before and after plating. The scale is designed around a Class III lever system. The platform is balanced by a counterweight so that a minimum

tare weight is applied to the scale. The thermoseal scale head is built around two precision calibrated steel springs, and because of its thermostatic control, will automatically adjust to zero over a wide range of temperatures. This scale has a capacity of 50 x 1/4 oz; features a stainless steel platform measuring 20 x 20 in. Dial is 13 in. diam. *John Chatillon & Sons.*

For more data circle No. 19 on postcard, p. 127.

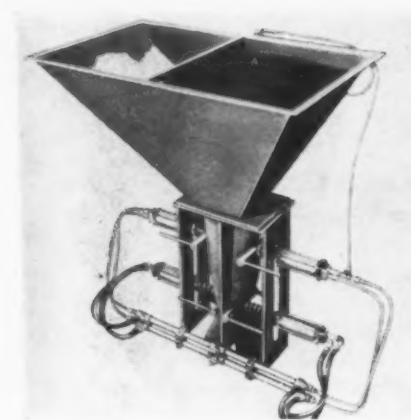


### Metal treating unit rated at 300 lb per hour

New automatic heat treating unit has such design advancements as 100 pct forced convection heating and long life radiant heating tubes. Operating at temperatures up to 1850°F, the unit also features controlled atmosphere and automatic handling, and complete automatic straight-through operation from heat through cooling or oil quench.

It serves a variety of metal treating needs including carburizing, normalizing, stress relieving and brazing. Complete atmosphere control during heating and quench cycles assures bright, scale-free work with no pickling or blasting operations required before plating or painting. *Ipsen Industries, Inc.*

For more data circle No. 20 on postcard, p. 127.

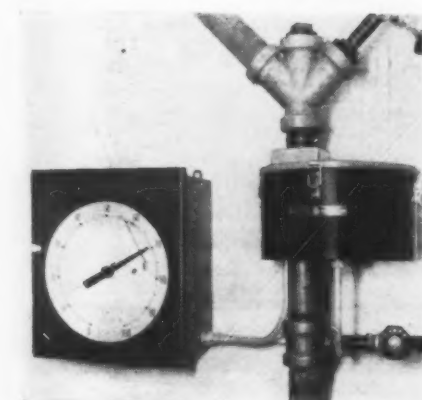


### Adds bonding material to foundry sand systems

For adding the correct amount of bond and other additives to foundry sand mixing systems the Bondadder is designed with a reciprocating hopper of adjustable size which is operated by an air cylinder. On each stroke the Bondadder dispenses into the mill a measured volume of any two of the following: clay, bentonite, cereal, wood, flour, silica flour or seacoal. Material to be added is stored in two

hoppers, each holding 150 lb of clay or seacoal. Hopper extensions are available for greater storage. Quantity of material added each stroke is adjusted by a calibrated slide. For batch type mills, the Bondadder makes one stroke per batch; for continuous mills, it adds a constant number of measured quantities per minute. *Harry W. Dietert Co.*

For more data circle No. 21 on postcard, p. 127.



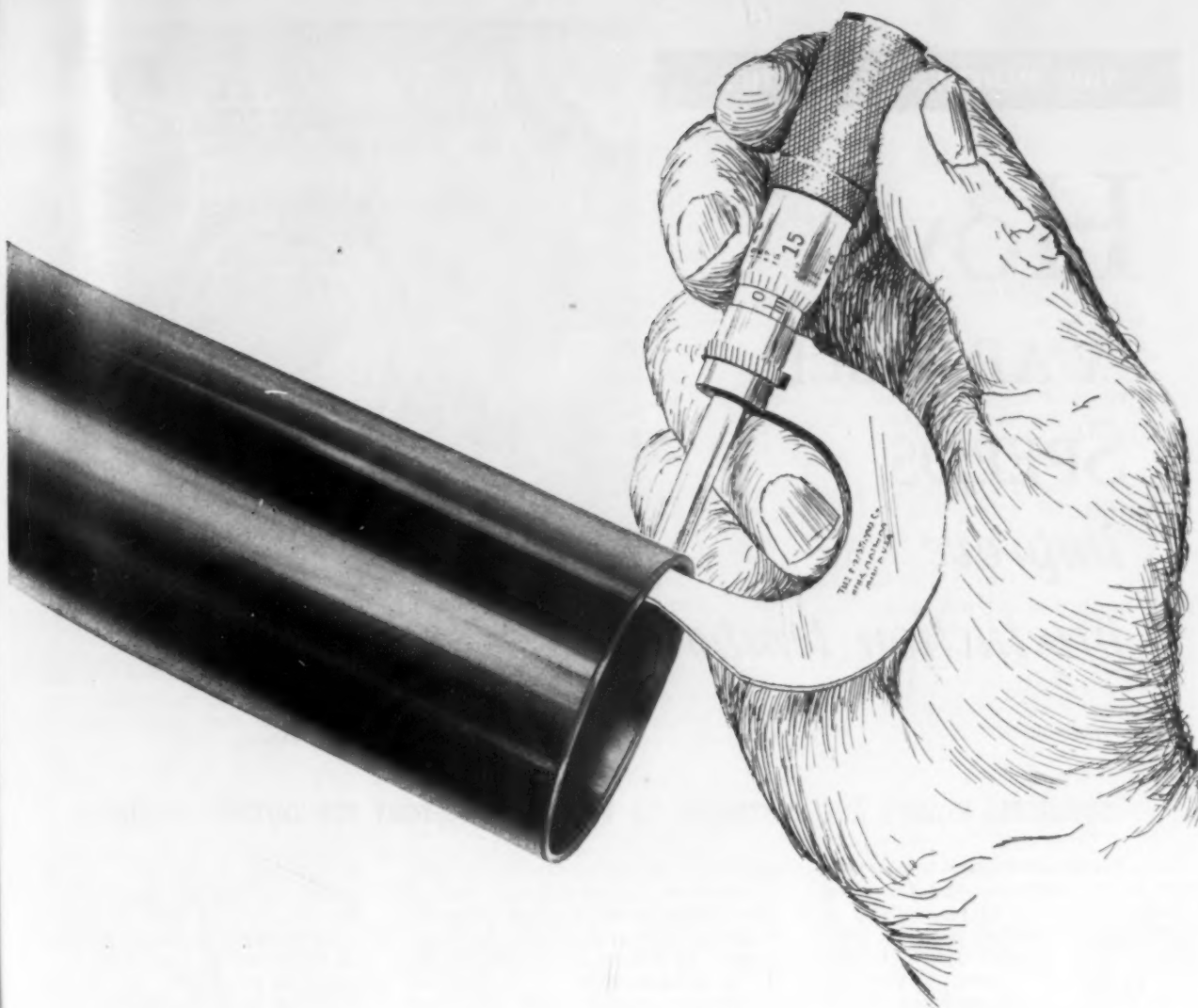
### Records number of particles suspended in liquids

In any process where filter effectiveness must be constantly monitored, a new turbidimeter continuously and automatically measures and permanently records the number of particles suspended in liquids. It can be used with an audible or visible alarm; provides readily available turbidity measurements for monitoring and controlling. Adjustable over a wide turbidity range, the turbidimeter

has a splash-proof construction and semi-null-balance system. Theory of operation is that if a liquid has no suspended particles, all light is transmitted while none is scattered, so that the ratio of scattered to transmitted light is zero. As turbidity increases more light is scattered, less transmitted, and ratio increases. *General Electric Co.*

For more data circle No. 22 on postcard, p. 127.

Turn to Page 138



*It has to be accurate  
...it's welded tubing*

● Since welded tubing is formed from flat strip, the wall thickness must be uniform throughout. This advantage is so well recognized that tolerances for wall eccentricity are not commonly included in specifications.

Brainard welded steel tubing is an economical structural material, and it offers many such physical advantages. Can it cut costs or reduce weight in *your* product designs? For complete information write Brainard Steel Division, Dept. O-9, Griswold Street, Warren, Ohio. An integrated producer; offices throughout the U. S.

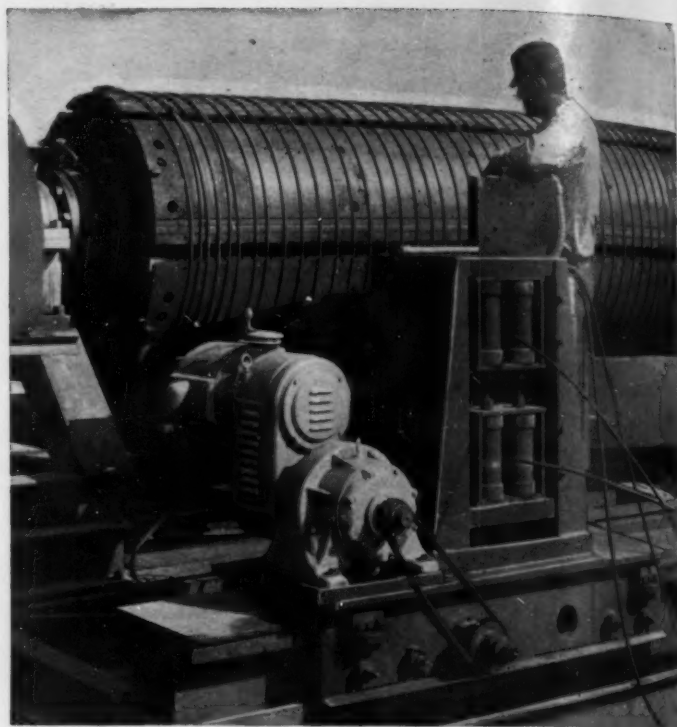


**WELDED STEEL TUBING**



THIS MONTH'S MOTOR TIPS

# How VARIABLE SPEEDS *improve production tempo*



U. S. Varidrive motor operating special drum machine for fabricating circular reinforcing cages for concrete pipe; permits speed variation to suit each diameter of wrapping.

## COUNTLESS PLANTS ARE SWITCHING TO VARIDRIVE MOTORS FOR OUTPUT EFFICIENCY

MAKING machines more responsive to the operator's command has resulted in an amazing step-up in production. Machines powered with conventional constant-speed motors "loaf on the job" during many operations, but the same machines driven with Varidrive motors can accomplish one or a combination of these improvements—(1) increase production by the adjustable "overdrive" of accelerated speed; (2) effect better cutting or operating action by setting speed at the precise rpm essential for the job; (3) provide the operator with infinite speeds to coordinate with his rhythm of movement or selection of speed that is, in his judgment, just the exact rpm to produce his best workmanship.

Just as an automotive engine operates at highest efficiency at a certain

speed, almost any production machine or powered equipment will produce more where selectivity of motor speeds is provided. In a study of advantages created by the use of variable speeds, the manufacturers of U. S. Varidrive motors have compiled a list of applications covering diversified fields ranging from sewing machine factories to sorghum mills. From most of these interesting applications the design engineer and plant production engineer can learn of uses they can apply to their own sphere of operations.

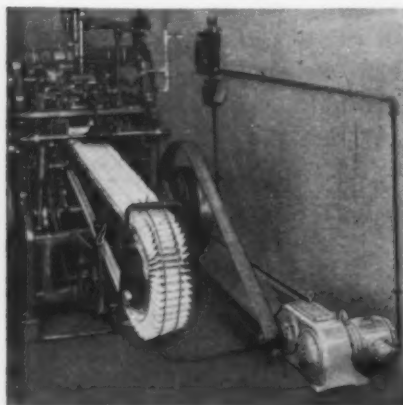
### NO GUESSING OF MOTOR SPEED

For instance, the design engineer doesn't have to try to guess what the ultimate speed factor will be in order to be sure his machine will deliver the full optimum of production *after*

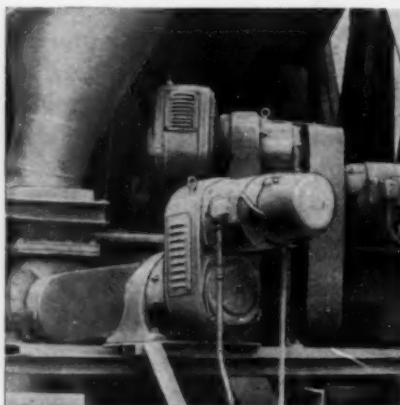
installation. By installing a Varidrive motor he endows his product with speeds instead of a speed; consequently in service his machine presents an "ableness" to adapt itself to a wide range of conditions far beyond his contemplation. If a fixed speed motor operates the machine the design engineer might have guessed wrongly the speed to give it.

### REMOVING RESTRICTIONS OF SPEED

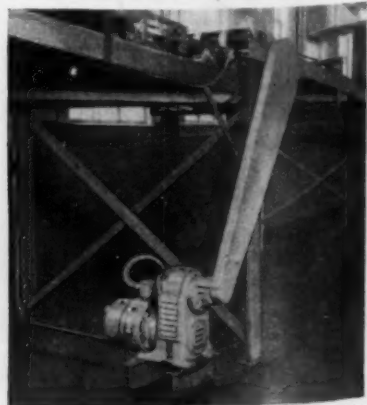
The plant production engineer need not be restricted to a set operating speed of a machine. He can, with the Varidrive, experiment with speeds to do a specific job best. For example, a conveyor may at times, when heavily loaded, require slow speed, then higher speed when the load is light, or when parts have to get to a worker's location



Envelope folding and glueing machine powered with U. S. Varidrive. For different sizes of envelope a different speed is required.

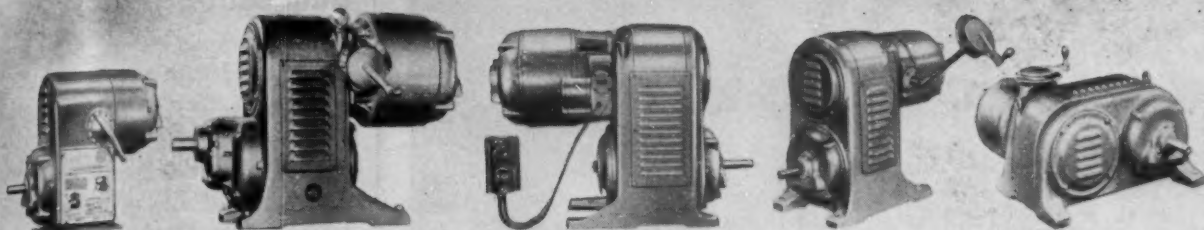


Varidrive on a mixing machine processing rotary drilling oil base. The proper mix depends on the exact speed required to blend materials.



Conveyor travel is controlled for better distribution and timing with a Varidrive. This conveyor is an automatic system for drying printed material.

## TYPICAL VARIDRIVE MOTOR TYPES



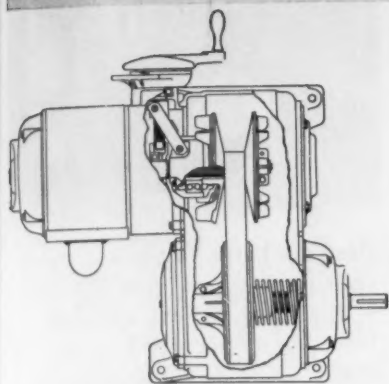
**TYPE VA—SMALL H.P.**  
Low cost model, ¼ to ¾ h.p. 4 to 10,000 rpm. Ratios 10:1. 1 & 3-phase.

**TYPE VEU—GH**  
Upright case with low shaft. Control dial on side.

**ELECTRIC CONTROL**  
Varidrive with Type ERC heavy-duty remote control motor.

**REMOTE CONTROL**  
One of many control arrangements. Control shaft can be extended.

**TYPE VE**  
Horizontal case with control dial on top of motor.



### OPERATION OF A VARIDRIVE

By turning control dial, the diameters of the belt discs expand or contract, thus changing fixed speed of motor shaft to variable speed of the take-off shaft. Quiet, shockless, enclosed transmission.

faster. In cutting shafts on a lathe from large to small diameter, frequent change in speed keeps the power tool operating at a uniform lineal travel to get the job completed in the least time. With a Varidrive, the speed can be instantly changed to synchronize with each specific travel or load condition.

Machines turning out different sizes of parts can produce better with variable speeds. If work chatters, feed can be adjusted for best surface speed, longer tool life and finer workmanship.

In experimental processes involving mixing in vats under varying condi-

tions of viscosity, temperature, homogenization or rate of agitation, variable speed plays an important role, which is impossible with a fixed speed motor. The right speed makes all the difference in getting the right mix. With Varidrive no step-cone pulleys, external gears, intermediate speed changers or connections, such as extra chains and couplings are needed. Usually a Varidrive can be direct connected to the prime driving shaft of the machine or equipment.

In pumping and hydraulic control operations variable speed is the answer. Flow, pressure, suction and load can be maintained at just the right equilibrium by a Varidrive. In some machines the exasperating problems of noise, chatter, vibration, over-heating and pulsation contribute to the shortened life of equipment, or affect the quality of the product undergoing processing. These troubles can be invariably "cured" with a Varidrive because the operator can experiment down to a split rpm to get the most sensitive speed to overcome the trouble.

### SPEEDS TO FIT TIMING FACTORS

Equipment is frequently required to complete an operation in predetermined time. Variable speed permits a step-up or step-down to establish the right production tempo. In controlling cycles of infra-red baking, drying, heating, soaking, grinding, capping, tumbling, coating, plating, etc., speed

movement must be precise—or rejects will cut into profits. What, then, is more logical than to install a Varidrive to provide the nerve-center of speed regulations?

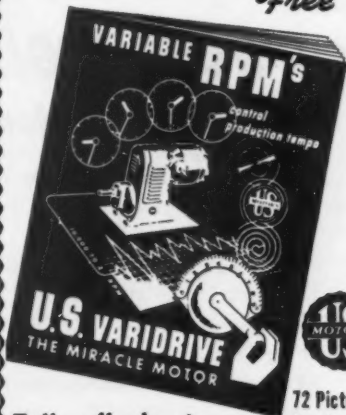
### IMPROVEMENT IN OUTPUT

In thousands of plants, the U. S. Varidrive motor has brought about amazing improvements in production. Powered machines have had their output stepped up to 30 percent or more in innumerable instances.

In general, these Varidrives can be obtained in a range of from ¼ to 50 h.p., and for speeds from 2 to 10,000 rpm in ratios of 10:1.

ADVERTISEMENT

## 16-Page Motor Booklet *Free*



72 Pictures  
22 Models

Tells all about

**U. S. VARIDRIVE MOTORS**

*Mail the Coupon*

Request for Varidrive Booklet

U. S. ELECTRICAL MOTORS Inc. IA-9  
Box 2058, Los Angeles 54, Calif., or Milford, Conn.

Send free 16-page Booklet. No obligation

NAME \_\_\_\_\_

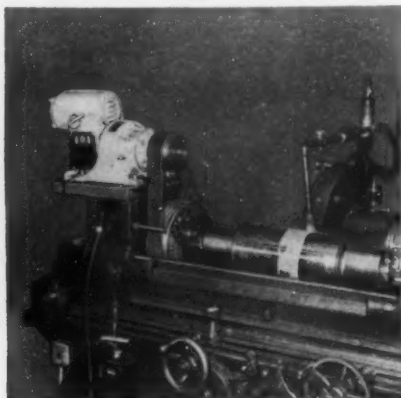
COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

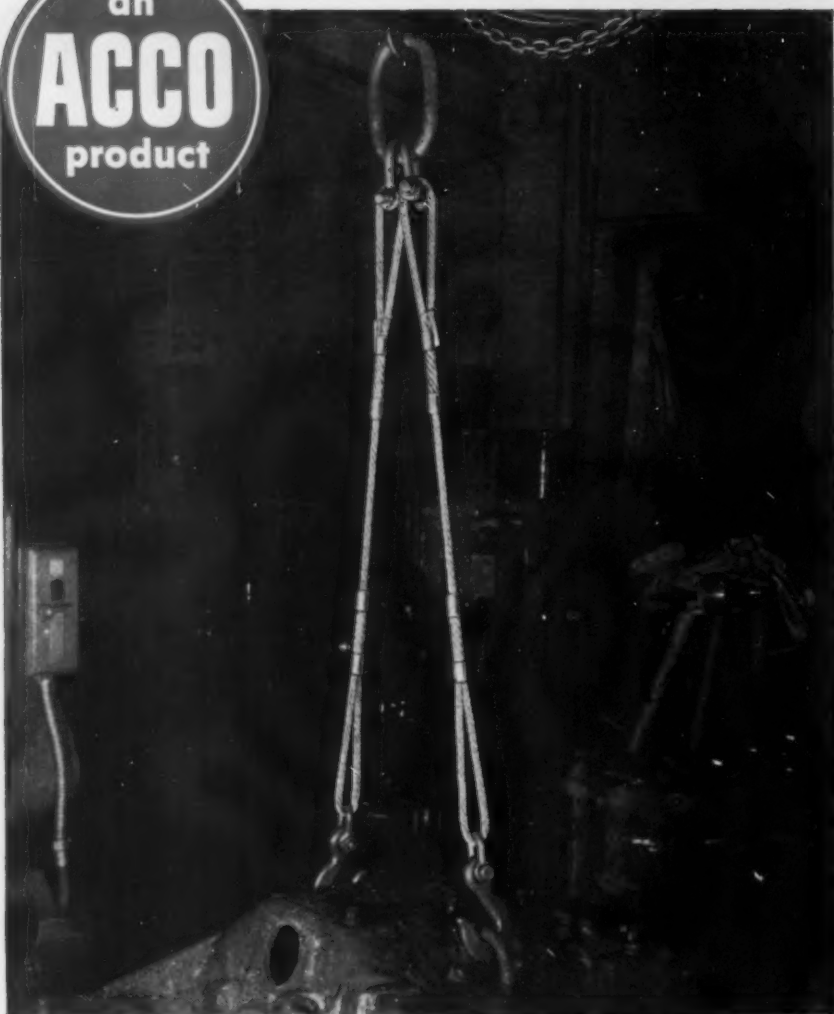
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



In a research laboratory this Varidrive motor operates test equipment for checking performance characteristics of water pumps.



This combination U. S. Varidrive-Syncro gear powers a special roll grinding machine for cold rolling aluminum sheets, from heavy to light gauge.



## How ACCO REGISTERED Stock Slings Save You Money—with Safety

1 • **You Get ALL the Strength You Pay For**—DUALOC\* Endings insure against any loss in the catalog strength of the preformed Green Strand wire rope the sling is made of.

2 • **You Lower Your Sling Maintenance Costs**—If damaged, any part of the sling can be replaced in your own shop with another ACCO Registered part of equal strength. No delay. You don't ship the whole sling to have one part repaired.

3 • **ACCO Slings are Stocked by Your Industrial Supply House**—His stock is based on YOUR needs. So, your sling inventory can be held to a minimum since your distributor's stock is as close as your telephone.

4 • **These Slings and Fittings are "ACCO Registered"**—This assures you of highest quality and safety throughout.

Write today to our Wilkes-Barre office for name of the ACCO Registered Sling distributor nearest you.

\*Trade Mark • Patent No. 2463199  
In Canada: Dominion Chain Co. Ltd.  
Niagara Falls, Ontario

**ACCO**



**WIRE ROPE SLING DEPARTMENT  
AMERICAN CHAIN & CABLE**

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles,  
New York, Odessa, Tex., Philadelphia, Pittsburgh,  
San Francisco, Bridgeport, Conn.

**ACCO  
Registered  
DUALOC  
Slings**

## New Equipment

Continued

### Bulk scoop

This hydraulic scoop attachment can be used with any Yale truck to provide an efficient method of picking up, transporting and dumping free-flowing bulk materials. Dumping can be controlled at any de-



sired discharge rate and at any elevation up to maximum lift height of the truck. It can be quickly attached to or removed from the fork truck. *Yale & Towne Mfg. Co.*

For more data circle No. 23 on postcard, p. 127.

### Special drillhead

A 16-spindle, straight-in-line drive, adjustable drillhead provides multiple drilling of a series of models of trowel handles having in-line holes with centers varying from



model to model. The illustrated head, with a spindle range of adjustment within 1½ in. radius of their respective driving points, has a ¼ in. drilling capacity in cast iron. *Thriftmaster Products Corp.*

For more data circle No. 24 on postcard, p. 127.



## New Equipment

Continued

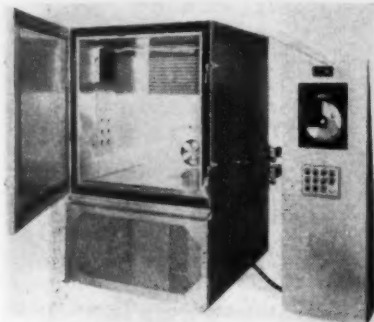
### Root protection flux

Easily removable root protection flux or inert gas welding has been produced especially for stainless steels where in normal operations the root of inert gas joint remains unprotected. When applied to the underside of butt and corner joints, penetration is simplified by the new flux action in controlling the molten weld metal. Overall underbead protection is assured. Eutector flux 569-I prevents oxidation which tends to form during welding and post heating. *Eutectic Welding Alloys Corp.*

For more data circle No. 25 on postcard, p. 127.

### Humidity chamber

A special feature of this humidity simulation chamber is that in addition to reproducing relative humidity from 20 to 100 pct, it will also simulate rainfall at 4 iph. All test factors are operated fully auto-



matically on a programmed cycle. The chamber has an interior working space of 64 cu ft and operates at temperatures from 2° to 85°C. *American Research Corp.*

For more data circle No. 26 on postcard, p. 127.

### Service tape

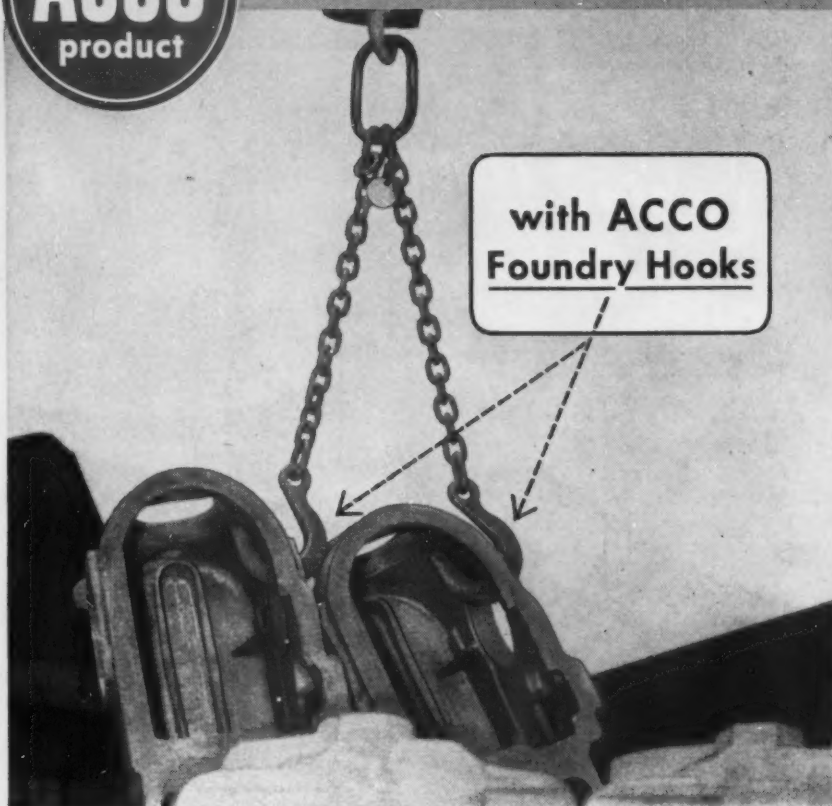
Tough pressure sensitive tape meets the severe service requirements of marking floor areas and overhead limits in industrial plants and other buildings. The product known as Permacel 32 colored plastic tape, is unaffected by ordinary solvents, acid, grease, oil, water or alkalis. Its quick sticking qualities make it easy and quick to put down direct from the roll. Comes in any desired width, and in white, red or yellow colors. *Permacel Tape Corp.*

For more data circle No. 27 on postcard, p. 127.

Turn Page



## ENDWELDUR SLING CHAINS



## How You Can Speed Up Handling of Castings

● Castings frequently are odd shaped and hard to hitch to with regular sling hooks. So AMERICAN developed the series 500 ACCO Foundry Hook with rounded point and wide mouth that can be hooked to a wide variety of lifts.

These hooks are drop forged of the same material as the chain. They are built into ACCO *Registered* Endweldur Sling Chains at the factory and the complete assembly is proof-tested from bearing to bearing.

ACCO Foundry Hooks are safer than home-made hooks. And they're cheaper because you save the cost of fabricating and assembling to the chain in your plant. The completed unit bears the well-known ACCO *Registered* identification ring—your assurance of highest sling chain quality.

See your AMERICAN CHAIN distributor  
or write our York, Pa., office for DH-130

ACCO



AMERICAN CHAIN DIVISION  
AMERICAN CHAIN & CABLE

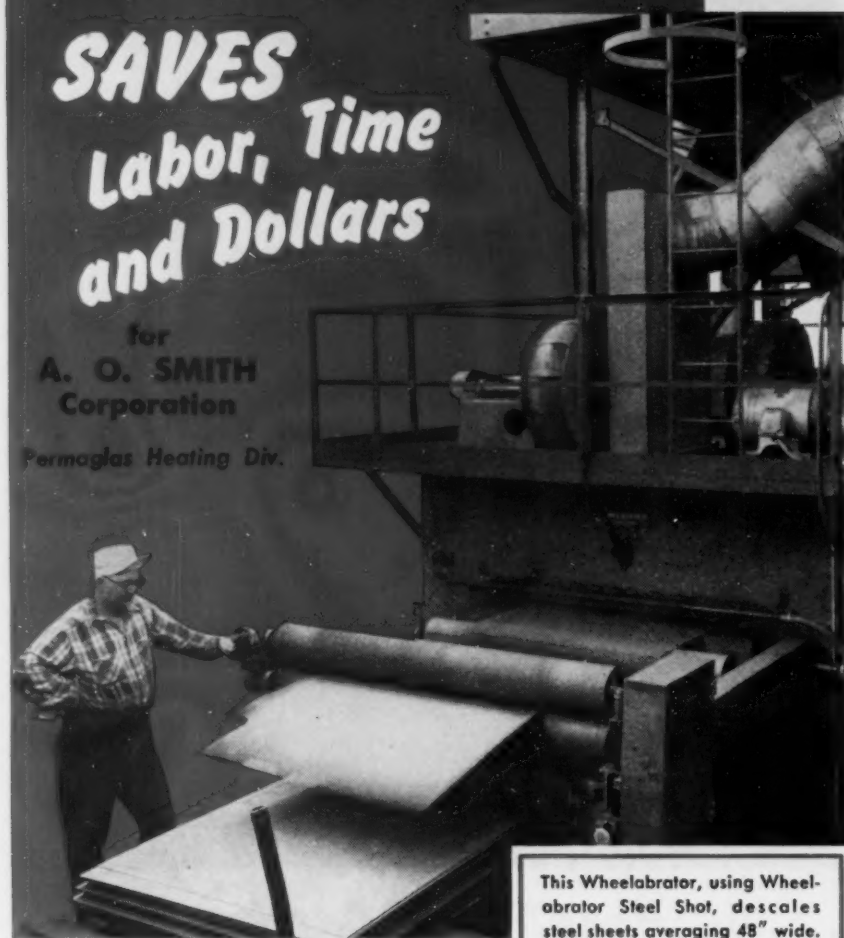
York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles,  
New York, Philadelphia, Pittsburgh, Portland,  
San Francisco, Bridgeport, Conn.

American  
Chain

**WHEELABRATOR®**  
**MECHANICAL DESCALING**

**SAVES**  
**Labor, Time**  
**and Dollars**

for  
**A. O. SMITH**  
Corporation  
Permaglas Heating Div.



This Wheelabrator, using Wheelabrator Steel Shot, descales steel sheets averaging 48" wide.

The Permaglas Heating Division of A. O. Smith Corp. has cut costs by using Wheelabrator airless blast cleaning for descaling steel sheets required in their water heater production. They have found that this process does an excellent job of descaling and at the same time saves labor, time and money.

This perfected airless centrifugal blast process, pioneered by *American*, uniformly scours away scale and dirt mechanically at low cost. It produces a surface which is superior to a pickled surface for all cold-working operations. The sheets will draw better, weld better, and when stored without oiling will resist rusting better than does pickled stock.

The Wheelabrator offers profitable advantages for steel producers and processors alike. It provides a more uniform etch for mill rolls and effects unusual economies in cleaning strip, sheet, bar stock and skelp.

*Send today for your copy of Bulletin 914 telling  
"How to Cut Steel Costs by Mechanical Descaling":*

*If you produce or buy Hot Rolled Sheet or Strip—  
Wheelabrate for Substantial Savings*

**American**  
**WHEELABRATOR & EQUIPMENT CORP.**

510 S. Bykrit St., Mishawaka, Ind.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST CLEANING EQUIPMENT

**Wheelabrator®**  
AIRLESS BLAST  
CLEANING

## —New Equipment— Continued

### Mechanical lubrication

An automatic precision lubrication system called the Lo-Flo lubricator is capable of delivering minute quantities of lubricant to as many as 36 individual points, regardless



of the difference in pressure required. It is available in 18 or 36 feed models, with or without group regulation of feeds. Flow rate per feed ranges from 213 cu in. per hr to less than 1 cu in. per 700 hr. Lubricants can vary from light oils to light grease at 60°F. *Nathan Mfg. Co.*

For more data circle No. 28 on postcard, p. 127.

### Aluminum paint

New asphalt heavy-bodied aluminum paint is designed for use on asphalt, bituminous and metal roofs. The product is pigmented with 3.9 lb of aluminum pigment per gallon, said to be approximately twice the usual amount. Permite asphalt aluminum assures extra life for any roof and keeps interiors much cooler. One coat gives full protection. *Aluminum Industries, Inc.*

For more data circle No. 29 on postcard, p. 127.

### Locking wrench

A new locking wrench works like an ordinary adjustable wrench but its jaws can be locked rigid at any setting. In addition it acts as a vise-wrench exerting a 100-lb grip on the bolt or machine component to which it is fastened. A 3-in. lever that snaps over the handle operates on the knurl and controls the jaw locking and unlocking action. *Utica Drop Forge & Tool Corp.*

For more data circle No. 30 on postcard, p. 127.

Turn to Page 142

# WHAT ARE YOU LOOKING FOR IN GEARS?

SMOOTH,

VIBRATION-FREE PERFORMANCE?

LONG LIFE?

QUIET OPERATION?

You get *all* of these in Farrel-Sykes gears — because they are *all* the product of precision generation, plus high-grade materials, plus the herringbone design.

Farrel-Sykes gears are made of the finest-grade materials available. They are generated by the famous Farrel-Sykes method — a process that assures extreme accuracy of tooth spacing, contour and helix angle.

The herringbone design provides evenly distributed pressure

over each tooth, from tip to working depth line. This means that there is no tendency for the contour of the teeth to wear unevenly and thus shorten the life of the gears.

Wherever power transmission must be smooth, quiet, and vibrationless under all conditions of load and speed, *specify Farrel-Sykes herringbone gears*. Information and engineering assistance available, without obligation.

Farrel-Sykes herringbone gears are made in any size from  $\frac{1}{4}$ " to 20' 0" diameter, for any power capacity and speed. Also available are straight tooth and single helical gears in sizes up to 20 feet diameter, and large internal gears with either spur or helical teeth.

## FARREL-BIRMINGHAM COMPANY, INC.

ANSONIA, CONN.—Plants: Ansonia & Derby, Conn., Buffalo, N.Y.

Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Detroit, Chicago, Memphis, Minneapolis, Portland (Oregon), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

# Farrel-Birmingham®

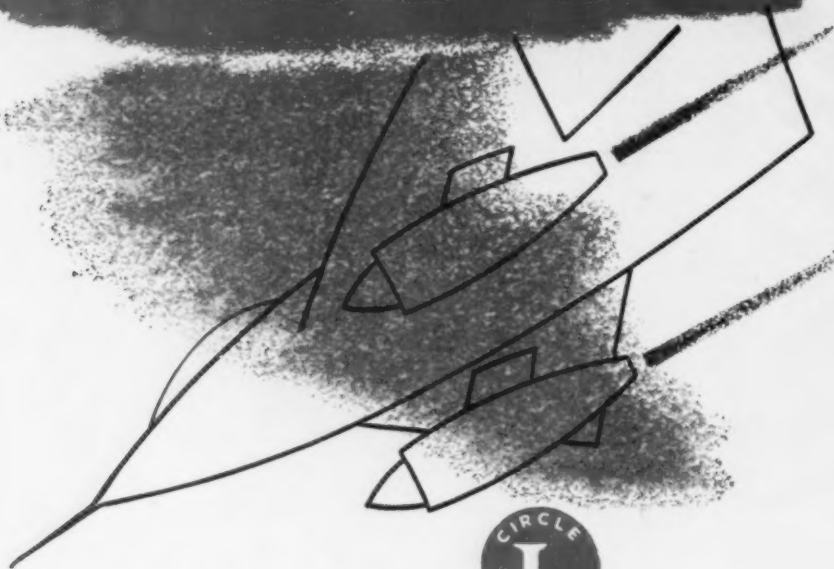
FB-310

September 17, 1953

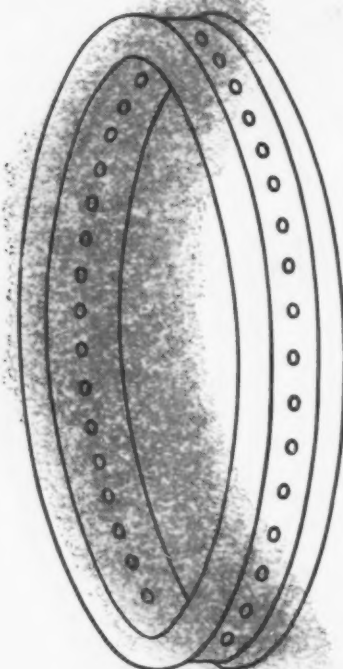
141



# In tomorrow's JET POWER PLANTS



## LEBANON Castings are at work



Lebanon Steel Foundry, the largest producer of centrifugal castings for jet engines, is proud to have collaborated with the Wright Aeronautical Division, Curtiss-Wright Corporation, in developing this unusual one-piece casting. It incorporates many holes cast to size and in accurate locations, requiring no machining. Of special high-strength alloy steel, this piece is quite large in size and is designed to operate satisfactorily under high temperature conditions in one of Wright's newly-designed power plants.

Lebanon Steel Foundry supplies castings to Wright for the J-65 (Sapphire) turbojet engine, which is now in production, and is producing experimental parts for the company's other advanced jet power plants.

## LEBANON Castings

CARBON, SPECIAL ALLOY  
AND STAINLESS STEEL



LEBANON STEEL FOUNDRY

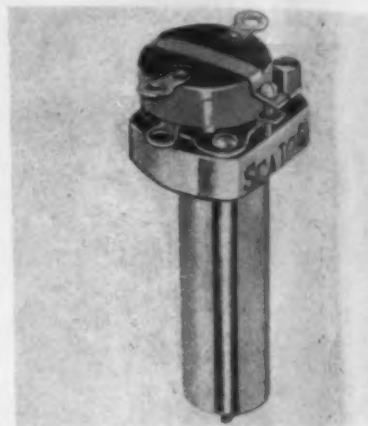
LEBANON, PA.

### New Equipment

Continued

#### Precision tempswitch

Tempswitch No. 3-C1200 provides close and accurate control where conditions require snap action of contacts. The entire assembly lends itself advantageously to application



of limited space. It measures  $2\frac{1}{4}$  x 1 in., weighs 1.2 oz. Principle of operation is the thermo-sensitive liquid fill in the case. As temperature increases, the plunger actuates the snap action switch. Fits into  $\frac{1}{2}$ -in. hole, secured by various means. Scaico, Inc.

For more data circle No. 31 on postcard, p. 127.

#### Triple-purpose gun

A precision built, low cost hand gun is said to efficiently clean small parts and surfaces with sand, liquid or air. The Carco gun operates on air pressures of 75 lb and up. It has a light, strong, durable



metal body; has a precision built valve and trigger assembly; is equipped with hardened steel jet and nozzle. C. A. Roesch & Co.

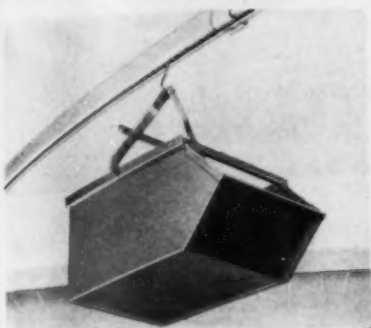
For more data circle No. 32 on postcard, p. 127.

## New Equipment

Continued

### Conveyor hanger

New conveyor hanger permits faster handling between storage and assembly of parts and materials stored in Stackbins. The new

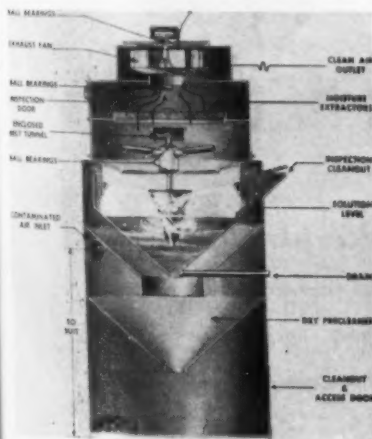


hangers are easily attached to the Stackbins, and lock securely in place without the use of tools. Stackbin Corp.

For more data circle No. 33 on postcard, p. 127.

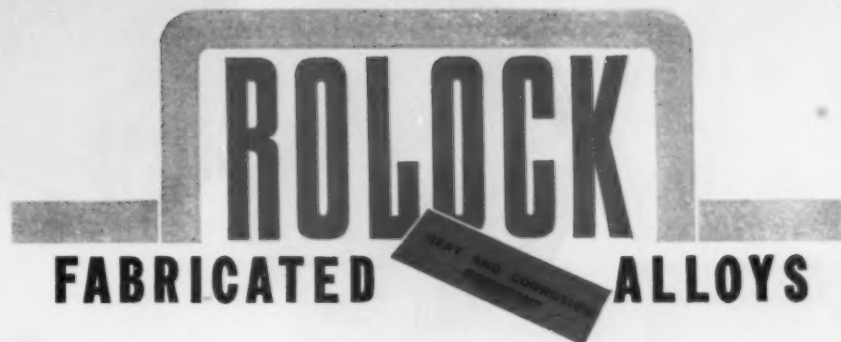
### Dust-fume eliminators

New Centri-Merge vertical rotor wet type dust and fume eliminators for industrial applications are built in two unit types. One unit is used for wet collection and elimination only; the other is a combination primary dry and secondary wet collection unit. The latter has a built-in dry type pre-cleaner for dry collection of heavier and most fine particles, and is use-



ful where material salvage is an operational requirement. Both units combine the cyclonic principle of dust separation and positive high pressure water action to remove impurities from the air in a torrent of water. Schmieg Industries, Inc.

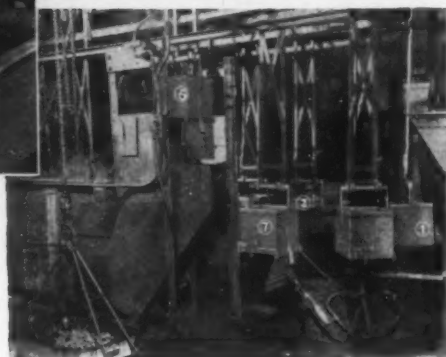
For more data circle No. 34 on postcard, p. 127.



GREATER PRODUCTION *thru an*  
AUTOMATIC PICKLE-WASH CYCLE



*for Valve Stems at*  
**A. SCHRADER'S SON**



Shown in the two photographs are start-to-finish steps of an automatic oval travel cycle for bright dips and washes of Schrader brass valve stems. The baskets (9" x 9" x 9") were made by Rolock from 18-8 stainless steel to carry 75-lb. loads. This system replaced hand pickling and has greatly increased production, lowered hour costs considerably.

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# The *Iron Age*

## SALUTES

*Raymond R. Grunwald*

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CHICAGO in the thirties wasn't very promising to a young man who had just landed his first factory job as a metal polisher. Particularly when his only previous business experience had been selling newspapers. But Ray Grunwald had that special blend of hard work, inventiveness and leadership that spells success at any time.

The combination paid off. Today Ray is president of his own firm, Grunwald Plating Co., one of the largest metal finishing job shops in the Chicago area, with three plants. He is also recognized as an articulate spokesman for his own industry and for small business generally.

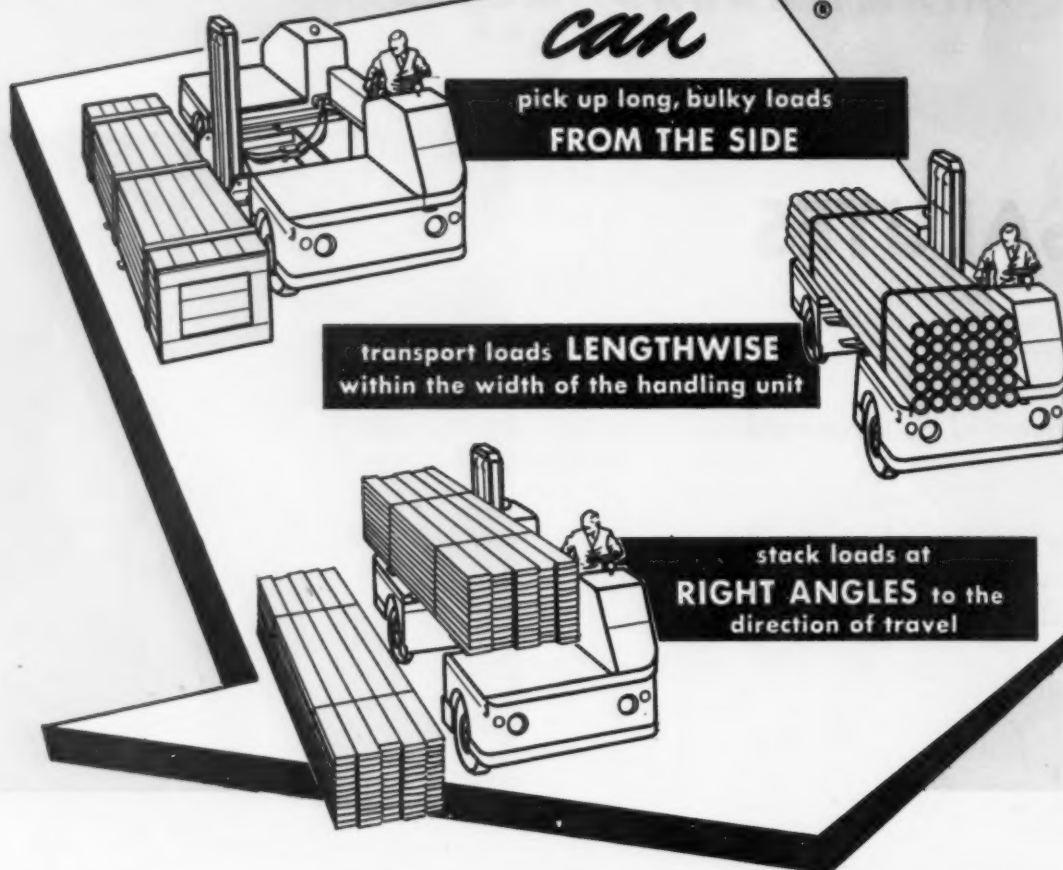
Concerned with community business problems, he has also represented his industry on a national basis in Washington and elsewhere. As co-chairman of the Committee for Educational Development of the Chicago Electro-Platers Institute, he takes a special interest in attracting young men and women into his field.

Ray hasn't neglected the technical side either. A pioneer in lucite plating barrels, his inventions have been widely adopted by electroplaters.

During World War II, he combined patriotism with a love of music, sponsored a weekly radio program honoring United Nations composers. "Proudly We Salute" ran 3 years, was rated one of the ten best broadcasts by The Actors Guild.

When he's not keeping his golf game up to snuff (low eighties) Ray likes to tend his collection of more than 200 rare and tropical plants.

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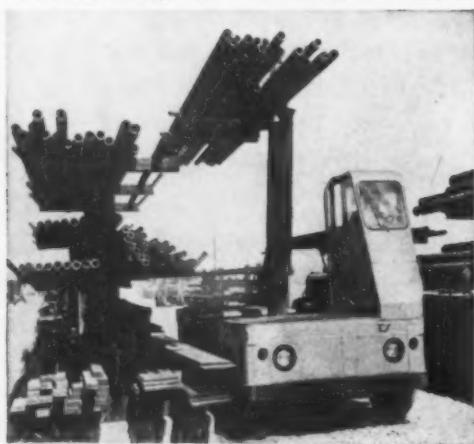


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# *The Iron Age*

## INTRODUCES

Dorward C. Witzke, becomes assistant to president, CLEVELAND GRAPHITE BRONZE CO.

V. V. Blasutta, appointed vice-president and director of engineer, DENISON ENGINEERING CO., Columbus, Ohio.

Dr. Harry A. Schwartz, becomes vice-president in charge of production, NATIONAL MALLEABLE & STEEL CASTINGS CO., Cleveland.

Roy Backman, elected vice-president-product sales, PACIFIC AIRMO-TIVE CORP., Burbank, Calif.

Floyd J. Compson, becomes director of purchases, BUICK MOTOR DIV., General Motors Corp., Flint, Mich.

Victor C. Armstrong, elected chairman of the board of directors, POOR & CO., Chicago.

J. Doyle DeWitt, elected to the board of directors, NILES-BEMENT-POND CO., West Hartford, Conn.; and Louis Reiss, elected treasurer.

Morgan R. Butler, Sr., elected director, WAUKESHA MOTOR CO., Waukesha, Wis.

F. T. Bowditch, appointed associate director of research, NATIONAL CARBON RESEARCH LABORATORIES, Cleveland.

Z. R. Meredith, named comptroller, THE AMERICAN BOX CO., Cleveland.

Jerold L. Welch, appointed chief engineer, REED-PRENTICE CORP., Worcester, Mass.

Paul F. Gavaghan, appointed supervisor, Chemical Div. news bureau, GENERAL ELECTRIC CO.

Robert C. Wade, appointed assistant director, Chemical Research Laboratory, METAL HYDRIDES, INC., Beverly, Mass.; and Robert D. Gray, appointed factory superintendent.

F. R. Schulz, appointed field engineer, Detroit area, LAMSON CORP.

Clydus F. Sells, appointed superintendent, industrial relations, Warren district steel plants, REPUBLIC STEEL CORP., Cleveland; and Joseph K. Bole, Jr., appointed assistant manager of sales, Bolt & Nut Div.

Walter J. Prochak, appointed assistant superintendent, Cold Drawn Bar Dept., Brier Hill works, THE YOUNGSTOWN SHEET & TUBE CO.

William E. Boger, appointed general superintendent, ALAN WOOD STEEL CO., Conshohocken, Pa.

Arnold J. Beyer, appointed division superintendent, power and fuel, Gary Steel Works, U. S. STEEL CORP.

John Gill, appointed assistant superintendent, Coke Plant, Midland Works, CRUCIBLE STEEL CO. OF AMERICA.

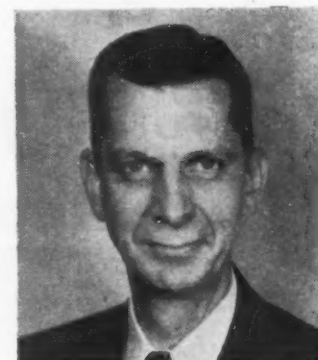
Dr. William C. Witham, appointed supervisor of the organic chemistry section, ILLINOIS INSTITUTE OF TECHNOLOGY; and William P. ter Horst, appointed supervisor, chemical engineering section.

C. V. McMains, named manager, tobacco foil sales, ALUMINUM CO. OF AMERICA.

T. J. Griffin, becomes head of welding and casting section, BUREAU OF SHIPS, Naval Dept., Washington. He succeeds A. G. Bissell, who has retired.



A. I. DAVIS, appointed assistant to the president, Federated Steel Corp., Pittsburgh.



B. C. YEARLEY, named director of applied research, process control and supervisory training, National Malleable & Steel Castings Co., Cleveland.



LAWRENCE H. FLORA, appointed director of sales, Tinnerman Products, Inc., Cleveland.



## Personnel

Harry B. Lilley, promoted to manager, Steel & Tube Div., District Office, Detroit, THE TIMKEN ROLLER BEARING CO., Canton, Ohio; John J. McGrann, promoted manager, Houston office; and R. R. Hershey, transferred to the Detroit office.

Charles H. Wirth, appointed manager for instrumentation recorder sales, New York office, AMPEX CORP.

Charles H. Myers, appointed assistant to the manager, Mining Dept., MINE SAFETY APPLIANCES CO., Pittsburgh.

William H. Eutzy, appointed assistant to manager of Westinghouse Television-Radio Div., WESTINGHOUSE ELECTRIC CORP.

Charles D. Harless, promoted to New York district manager, NATIONAL GYPSUM CO., Buffalo.

Donald C. Duvall, appointed assistant works manager, Monessen Plant, PITTSBURGH STEEL CORP.

Guy Pitts, appointed division manager, Brass & Bronze Div., THE BOHN ALUMINUM BRASS CORP., and Frank Turnbull, appointed buyer of scrap material, Michigan Smelting & Refining Div.

Harry H. Armstrong, appointed to handle distributor sales, Building Products Div., AMERICAN WELDING & MFG. CO., Warren, Ohio.

James H. Moore, appointed general manager, Vacuum Metals Corp., wholly owned subsidiary of NATIONAL RESEARCH CORP., Cambridge, Mass.

S. David Tyler, appointed assistant general manager, EATON MFG. CO., Foundry Div., Vassar, Mich.; Paul W. Olson, named resident manager; Howard R. Johnson, becomes factory manager; Ralph F. Evert, named assistant sales manager; and Daniel J. Schindehette, named plant controller.

Philip B. Weaver, appointed assistant to the general sales manager, HARBISON-WALKER REFRATORIES CO.



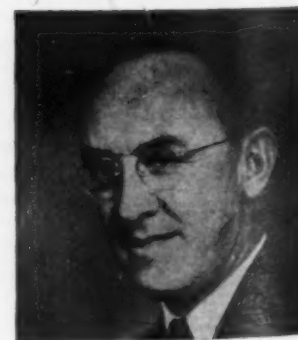
ROBERT E. DICKSON, appointed director of purchasing, Ainsworth Mfg. Corp., Detroit.



DAVID WALTERS, appointed chief industrial engineer, Bohn Aluminum & Brass Corp., Detroit.

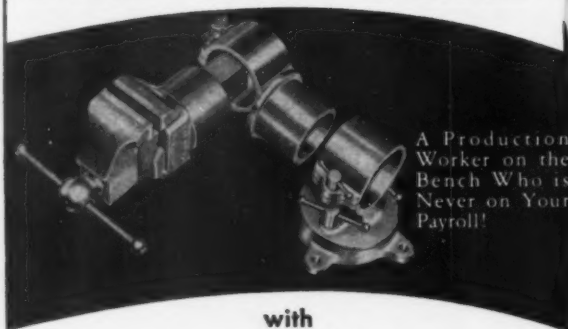


RUSSELL L. BAKER, named manager, Builder Sales Dept., Republic Steel Kitchens.



WILLIAM J. THOMAS, appointed general manager, Tubular Products Div., The Babcock & Wilcox Co.

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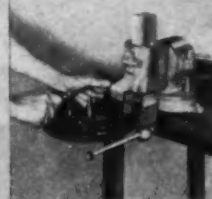
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Good news for fabricators! With Pennsalt's great new etchant—AE-16—you can give aluminum a beautiful satin finish *without* experiencing the usual headaches of sludge and scale—and at considerable lower cost than with any equivalent product!

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Of course, AE-16's non-scaling characteristic means reduced tank maintenance costs, also. The AE-16 tank was cleaned by merely flushing it down with a hose—no chipping, no shoveling of rock-like scale.

**AE-16 is a quality etchant** In from one-half to ten minutes at normal tank temperatures, it produces a smooth, even, satin surface that easily conceals

die marks and surface flaws. Few additions are required to keep up its working strength, and you'll find Pennsalt's method for determining the concentration exceptionally easy to follow.

All this means less down time, trouble-free operation, lower maintenance costs, increased production. Yet, even with its many advantages, *AE-16 actually costs less* than any comparable product on the market!

AE-16 is part of a complete aluminum preparation "package" Pennsalt now offers to fabricators. To help you use these excellent materials with maximum efficiency, Pennsalt also offers a Metal Processing Service, staffed by specialists in this field.

**Further information**—on AE-16 or on any of the other products in the Pennsalt "package"—is yours for the writing. Address: Metal Processing Service, Pennsylvania Salt Manufacturing Company, East: 284 Widener Building, Philadelphia 7, Pa. West: 2168 Shattuck Ave., Berkeley 4, Calif.

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**Pennsalt Cleaner A-27:** A new all-purpose non-etching cleaner that thoroughly removes all tough soils, including red and black marking inks. Rinses quickly and completely, even when allowed to dry on the work. Will not streak or stain.

**Pennsalt Aldox\*:** A new powdered, acid-type desmutter and deoxidizer. Replaces nitric acid, does away with carbonyls and fumes.

**Pennsalt Cleaner #85:** An alkaline cleaner and deoxidizing agent recommended when aluminum is coated with a heavy layer of oil.

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**Pennsalt Cleaner EC-51\*:** A non-staining, organic-type emulsion cleaner.

**Pennsalt Cleaner EC-54\*:** An emulsion cleaner which will not boil off, evaporate, or flash at use temperatures.

\*Trade Name of PSM Co.



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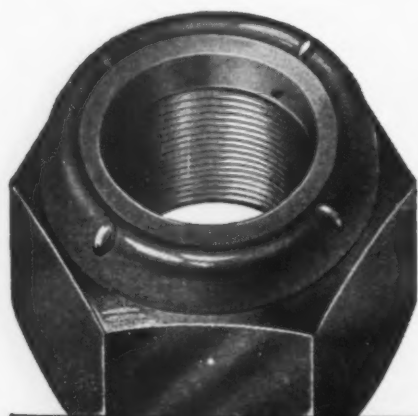
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# GREER Stop Nuts

## Personnel

### Continued

John E. Russell, appointed district sales manager, Milwaukee sales, FOLLANSBEE STEEL CORP.

Robert B. Duthie, made general manager, MODERN PROCESS PLATING CO., a subsidiary of Viking Air Conditioning, Cleveland.

George C. Murphy, appointed general manager, THE HEILMAN CO.

Calvin W. Tittsler, appointed eastern and southern regional sales manager, DELUXE SAW & TOOL CO., a subsidiary of Rockwell Mfg. Co.

John W. Raisbeck, appointed assistant general sales manager, Kaiser-Willys Sales Div., WILLYSMOTORS, INC., Toledo.

Haven C. Babb, appointed assistant advertising manager, STANDARD PRESSED STEEL CO., Jenkintown, Pa.

Sherman T. Ramey, appointed advertising manager, THE TIMKEN-DETROIT AXLE CO., Detroit.

John E. Bush, appointed district representative, Chicago territory, ELMES ENGINEERING DIV., American Steel Foundries.

Virgil C. Reed, named field representative, southeastern and southwestern states, ALLOY RODS CO., York, Pa.

Jack E. Daniel, named field representative, Industrial Bellows Div. SOLAR AIRCRAFT CO., San Diego; and Harold R. Ehlers, appointed engineer.

Nields B. Haas, appointed mid-eastern regional sales manager, Alloy Tube Div., Union, N. J., THE CARPENTER STEEL CO.

## OBITUARIES

A. M. Giefer, vice-president, Standard Conveyor Co., North St. Paul, Minn., suddenly.

Raymond E. Noonan, 40, assistant treasurer and chief auditor, Reynolds Metals Co., in Richmond, Va.

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**Technical Articles**



By A. S. Jameson  
Supervisor of Metallurgical  
Research Laboratory



J. A. Hलगren  
Chief Research Metallurgist



R. H. Pinkel  
Metallurgical Research Engineer  
International Harvester Co.  
Chicago

♦ **SUCCESS IN MANUFACTURING** is largely the ability to produce a part which fully serves its purpose, and at the lowest cost. At one time, the trend had been toward use of highly alloyed steels. Now, improved heat-treating equipment, closer scientific control over processes and the know-how contributed by metallurgists are helping the trend toward the use of leaner alloys and carbon steels.

Hardenability is of prime importance in considering use of a leaner alloy or carbon steel to replace a more highly alloyed steel. To exemplify this point, carbon steel is being used to replace molybdenum alloy steel as a bolt material

# CARBON STEEL Can Replace Alloy for Small Diameter Bolts

♦ Hardenability is the important factor to consider in replacing a highly alloyed steel with a leaner alloy or carbon steel. . . Small diameter coarse thread bolts previously made of a molybdenum alloy steel can be made of C-1040 steel—without sacrificing strength.

♦ Improvement of the hardenability value of the quench gives a minimum center hardness of 45Rc in a  $\frac{3}{8}$ -in. carbon steel bolt section by oil quenching. . . Hardness, tensile and fatigue values for carbon steel bolts are comparable to those of alloy steel. . . Bolts meet SAE specifications.

without sacrificing strength. This is done in quenched and tempered bolts by quenching out to a center hardness of RC 45, which represents a 50-pct martensitic structure, then tempering at not less than 800°F.

Hardenability for AISI 4037 steel shows a minimum of J45 at slightly more than 2/16 in.<sup>1</sup> The SAE Hardenability Data Report (May, 1944) shows a minimum calculated hardenability at J45 of less than 2/16 in. for fine-grained carbon steel with minimum analysis of 0.41 pct C, 0.57 pct Mn. In 61 actual heats, the J45 value is also less than 2/16 in.

In applying these data to data on correlation of identical cooling rates in the Jominy bar and quenched round bars,<sup>1</sup> there is no reason to believe that mildly agitated oil quenching will give a center hardness of 45 Rc, except in sections  $\frac{1}{4}$  in. or less. However, it is general practice to use AISI 4037 steel for 7/16-in. diam bolts and apply SAE specifications<sup>2</sup> for Grade 8 bolts which call for a minimum yield proof load of 120,000 psi, minimum tensile strength of 150,000 psi, and minimum hardness of 32 Rc.

The probable explanation is that modern heat-treating equipment is used where the H value of the quench is greater than the value implied by

the expression "mildly agitated oil quenching." One article implies that special oils can bring about an increase in hardness penetration.<sup>3</sup>

By improving the H value of the quench, it is possible to obtain a minimum hardness of 45 RC at the center of a 3/8-in. carbon steel bolt section by oil quenching. With some control of the steel analysis and grain size, this hardness can be obtained at the center of a 7/16-in. bolt section.

Several tests were made to substantiate whether carbon steel can replace alloy steel for bolts of small diameter. Table I gives the oil-quenched center hardness of 5/16, 3/8, 7/16-in. diam bolts taken from 22 heats of carbon steel. These bolts were quenched as closely as possible to the interpretation of a "mildly agitated oil quench." One lot of 3/8-in. diam bolts and three lots of 7/16-in. diam bolts failed to quench out to a minimum center hardness of 45 RC. Additional bolts from these lots were then quenched from a production heat-treating furnace, the results of which are given in Table II.

Data in Tables I and II allow these conclusions:

TABLE I  
HARDNESS OF CARBON STEEL BOLTS  
After "A Mildly Agitated Oil Quench"

Bolt Size, in.	Thread	Lot No.	Hardness, RC		Composition, pct		Grain Size at 1700°F
			Surface*	Center	C	Mn	
5/16	C	1		51	0.39	0.66	3
	C	2		52	0.40	0.76	4
	F	3		53	0.42	0.82	4
	F	4		53	0.35	0.76	2
3/8	F	5	53	51	0.42	0.69	4
	F	6	53	52	0.43	0.73	4
	F	7	53	50	0.45	0.74	3
	F	8	55	56	0.42	0.82	3
	C	9	53	56	0.41	0.87	3
	C	10	51	50	0.40	0.88	3
	C	11	51	49	0.40	0.80	4
	C	12	53	54	0.43	0.81	4
	F	13	38	32	0.42	0.70	6
	C	14	54	56	0.47	0.75	4
	C	15	54	52	0.43	0.76	4
	F	16	53	52	0.43	0.88	3
7/16	F	17	52	50	0.41	0.73	3
	C	18	34	30	0.44	0.72	6
	C	19	34	26	0.40	0.71	6
	F	20	50	48	0.38	0.80	3
	F	21	49	40	0.36	0.81	2
	F	22	53	47	0.41	0.81	3

\* 1/8 in. removed from surface.

TABLE II  
HARDNESS OF CARBON STEEL BOLTS  
After Oil Quenching from Production Furnace

Bolt Size, in.	Thread	Lot No.	Hardness, RC		Composition, pct		Grain Size at 1700°F
			Surface*	Center	C	Mn	
3/8	F	13	54	53	0.42	0.70	6
7/16	C	18	48	43	0.44	0.72	6
	C	19	53	49	0.40	0.71	6
	F	21	52	47	0.36	0.81	2

\* 1/8 in. removed from surface.

† The production furnace has quenching facilities better than a "mildly agitated oil quench."

† Requirement of 45 RC at the center can be met for 3/8-in. diam bolts with production quenching facilities.

† Fine-grained steel 7/16-in. diam bolts will not always meet the 45 RC center hardness requirement.

† Coarse-grained steel in 7/16-in. diam bolts will meet the 45 RC center hardness requirement with modern production quenching facilities.

Tensile test data were obtained on C-1040 and 4037 steel bolts for comparative purposes. Heats were selected on the low side of the hardenability range for both steels as may be deduced from the chemical composition. Analysis of the carbon steel was 0.41 pct C, 0.62 pct Mn, and 0.16 pct Si. Analysis of the molybdenum steel was 0.38 pct C, 0.75 pct Mn, 0.21 Si and 0.21 pct Mo. The carbon steel had an inherent grain size of ASTM 3 to 4 and molybdenum steel ASTM 7 predominating with some No. 4 grains.

The bolts, 3/8 in. x 2 in. coarse-thread series, were heat treated by heating to 1550°F for 35 min and quenching in "mildly agitated" oil. The C-1040 bolts had a surface hardness of 51 to 53 RC and a center hardness of 45 to 47 RC. The 4037 bolts had surface hardness of 53 to 54 RC and center hardness of 51 to 53 RC. The oil quenched bolts were tempered from 700° to 1050°F at 50°F intervals for 1 hr. Tempering curves for both steels are given in Fig. 1. A 50°F lower tempering temperature for C-1040 steel gave the same hardness as for 4037 steel. This temperature, however, was above 800°F.

Tensile strength of bolts under 10° wedge

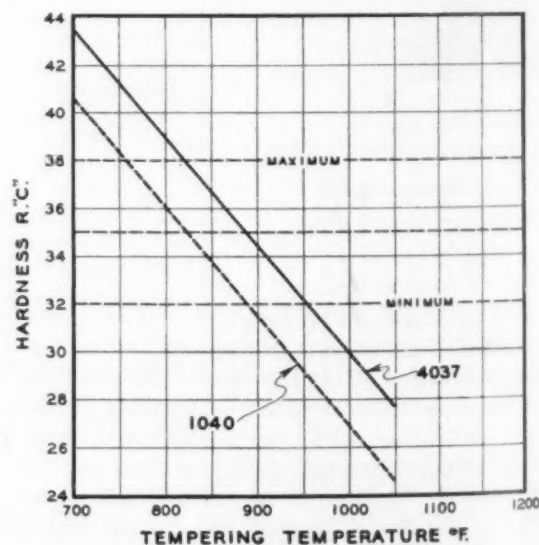


FIG. 1—Hardnesses of 1040 and 4037 steel bolts were similar when tempered after oil quenching. A 50°F lower tempering temperature was used for the 1040 steel than for the 4037 steel. Bolts were 3/8 in. x 2 in. of the coarse-thread series.

FIG. 2—Tensile strength of carbon steel  $\frac{3}{8}$  in. x 2 in. coarse-thread bolts meets the requirement of 150,000 psi. Testing was done under 10° wedge loading for a three-thread gage length.

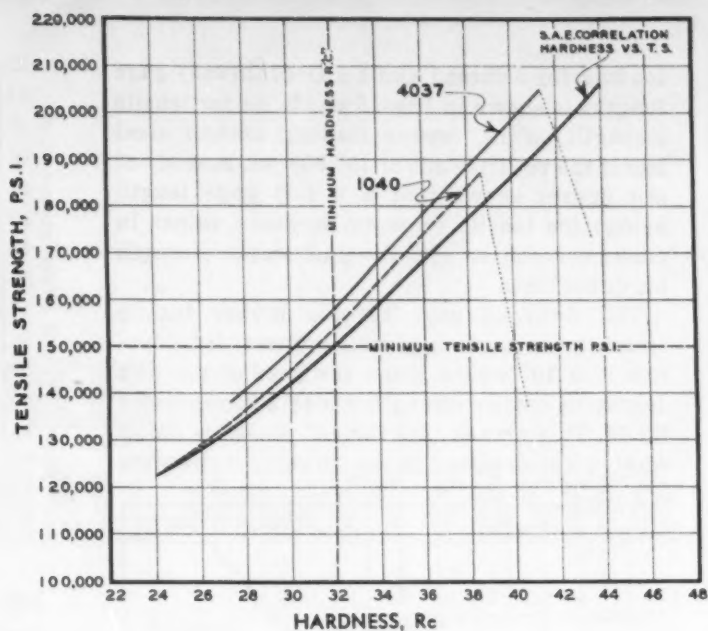


FIG. 3—A 1 x D (6-thread) gage length brings tensile strength hardness values of 1040 and 4037 steel bolts into closer correlation with SAE tensile strength hardness line. The  $\frac{3}{8}$  in. x 2 in. bolts were tested under 10° wedge loading.

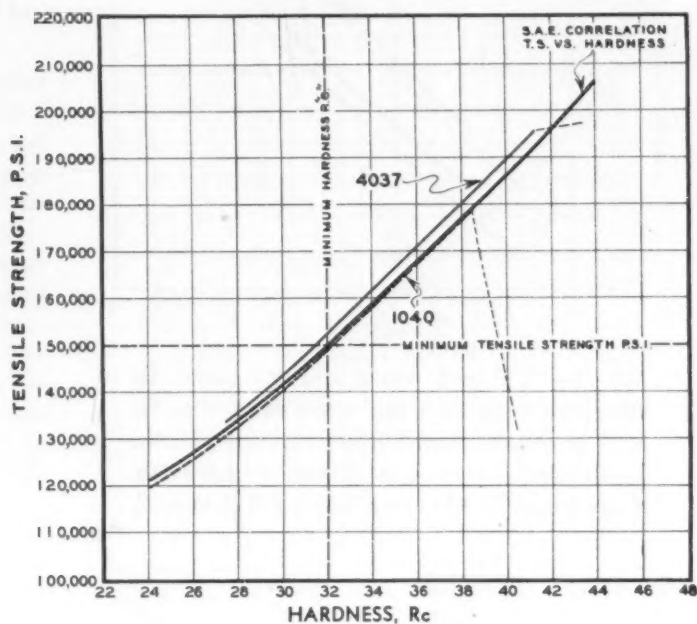
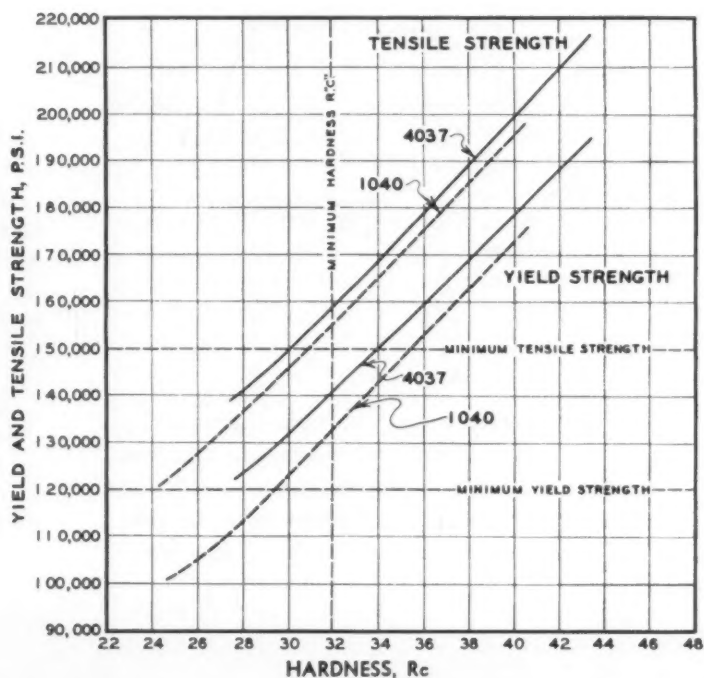


FIG. 4—Yield and tensile strengths for carbon steel bolts under axial loading meet minimum requirements of SAE specifications. Tests were run with  $\frac{3}{8}$  in. x 2 in. coarse-thread bolts at 3-thread gage length.





loading for 3-thread and 1 x D (6 thread) gage lengths is shown in Figs. 2 and 3. As for tensile strength on 10° wedge loading, carbon steel meets the requirement of 150,000 psi. A study of the figures shows that a 1 x D gage length brings the tensile strength hardness values in closer correlation with the SAE tensile strength hardness line.

The 3-thread gage records higher tensile strength values at a given hardness. Introduction of a 10° wedge under the head of the bolt decreases tensile strength above a hardness of RC 38. This proves that the 10° wedge is doing what it was designed to do—to reject bolts with

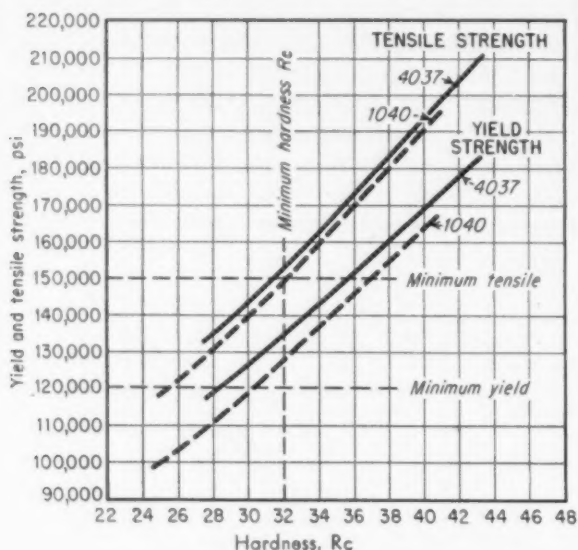


FIG. 5—Yield and tensile strength curves for 1040 steel bolts, as in Fig. 4, are lower than for 4037 steel bolts. These values increase with the percentage of martensite formed on quenching. Gage length in these tests was 1 x D (6-thread).

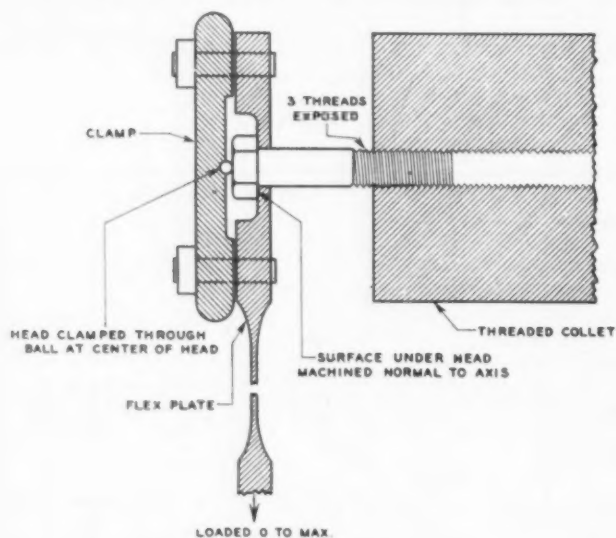


FIG. 6—Fixture is part of testing machine in which bending fatigue tests were run. Surface under head bolt was machined perpendicular to longitudinal axis of bolt and held tightly by yoke applying pressure through hardened steel ball.

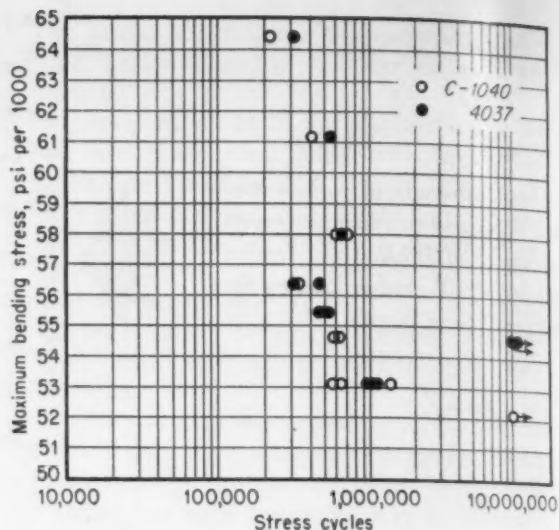


FIG. 7—Results of bending fatigue tests show that performance of 1040 steel bolts closely matches that of 4037 steel bolts. Hardness level of both steels was 35 Rc.

little capacity for plastic flow before failure.

Yield and tensile strengths under axial loading are shown in Figs. 4 and 5. The carbon steel meets both the minimum yield and tensile strength requirements of SAE specifications.

Bending fatigue tests were run on a SF-1U universal fatigue testing machine. Each bolt was machined under the head to make this surface perpendicular to the axis of the threads. This surface was held tightly against the loading flexplate by a yoke which applied pressure through a 3/32-in. hardened steel ball located on the longitudinal axis of the bolt, at the opposite face of the head. This is illustrated in Fig. 6.

The formula used for calculating bending stresses is a modification, through strain gage analysis, of the formulas for a beam supported at one end and either free or guided at the other.

This formula is:

$$\text{Bending stress} = \frac{Wl}{1.3Z}$$

Where:

W = Applied load

l = Beam length = 1.000 in.

Z =  $0.098d^3$

d = Root diameter 0.293 in. (theoretical)

Dynamic stresses are about 5 pct less than maximum applied stresses. Tests on bolts at hardnesses of 35 Rc for both steels indicate that the performance of carbon steel bolts is similar to that of alloy steel bolts as shown in Fig. 7.

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- Physical Requirements for Bolts, Cap Screws, Studs and Nuts, SAE Handbook, p. 143, 1952.
- Fast Quench Oil Improves Hardenability in Aircraft Steels, J. McElgin, THE IRON AGE, Jan. 24, 1952.

# AUTOMATIC FEEDING DEVICES PRODUCE SMALL PARTS FASTER



By S. J. White  
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Flint, Mich.

♦ VALVE GUIDE bushings for the new Buick V-8 engine are among the small parts machined with high precision, yet at a rapid rate, in the plant recently added to the Buick Motor Division factory in Flint, Mich. These bushings are cast in multiple-cavity molds in the adjacent Buick gray iron foundry. Castings are solid individual bars  $2\frac{3}{8}$  in. long and slightly over  $\frac{7}{8}$  in. in diam.

For the initial machining operation, the castings are dumped into the automatic hopper of the first of three centerless grinders shown in Fig. 1. Feed to, through and between the grinders is completely automatic. Grinders perform one rough and two semifinish grindings on the

♦ Automatic hopper and magazine feeds reduce handling and speed machining operations . . . At Buick they are used in the machining of cast iron valve guide bushings.

♦ Centerless grinders, with automatic feed hopper and advance, remove 0.065 in. of metal from outside diameter of 18,000 bushings in 8 hr. . . . Final cuts are made after bushings are inserted in cylinder heads processed on transfer machine.

outside diameter, removing a total of about 0.065 in. of metal in the three passes. Total output approximates 18,000 pieces per 8-hr shift.

Ground parts are then conveyed to two six-spindle automatics, Figs. 2, and are fed by hand into the magazine of each machine. Work pieces are automatically fed to the chucks from the magazine and automatically machined and ejected. Operations include drilling the central through hole in four steps, reaming the hole and chamfering the outside diameter. Each machine handles 250 bushings per hr and only one man is required to tend the two machines, including loading the magazines.

From these machines the parts are transferred to the hoppers of four lathes. In these

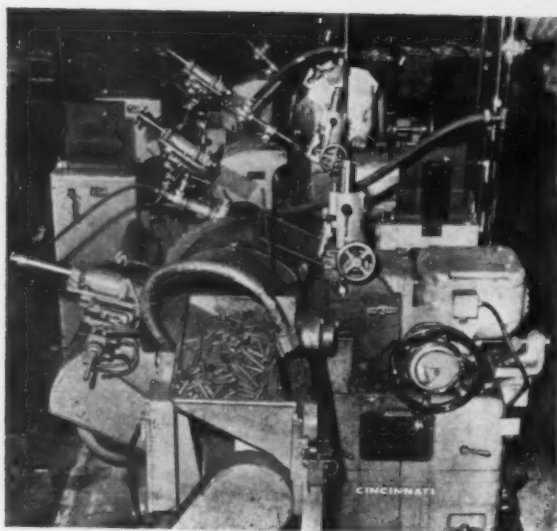


FIG. 1—Centerless grinders with automatic feed hopper and advance remove 0.065 in. of metal from outside diameter of 18,000 cast iron valve guide bushing blanks in 8 hr.

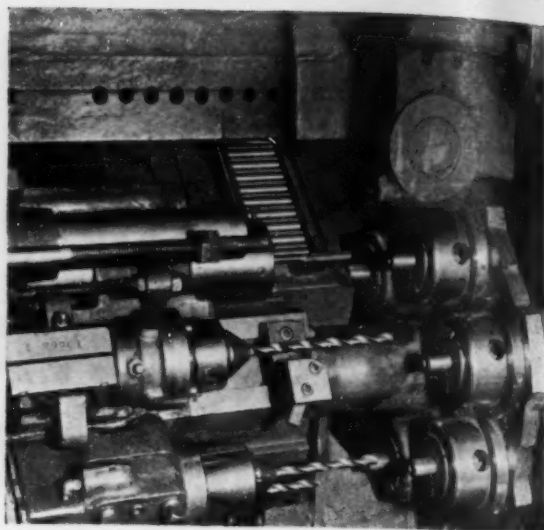


FIG. 2—Using automatic magazine feed, a six-spindle automatic drills and reams central hole and chamfers outside diameter of 250 cast iron valve guide bushings per hr.

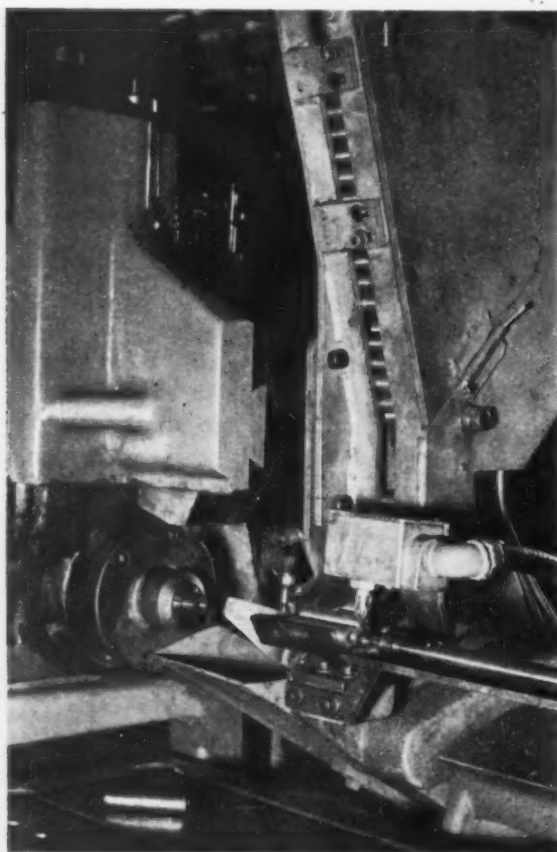


FIG. 3—Single-spindle lathes with automatic hopper feed, air chucks and tools, each cut off, face and chamfer the second end of 720 valve guide bushings an hour.

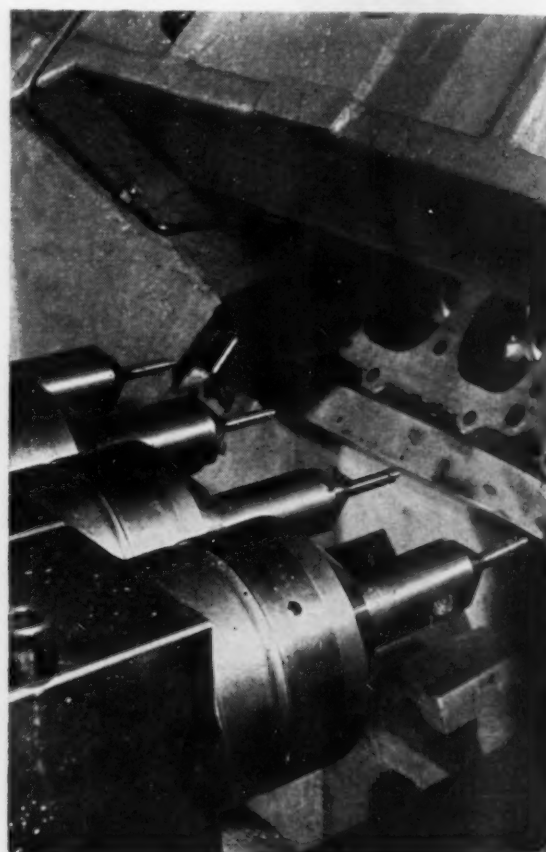


FIG. 4—Four boring tools used at first station of cylinder head transfer machine. Carbide tipped tools on end of holders final bore pressed-in valve guide bushings.

hoppers the parts are fed automatically one at a time into the air-operated chucks of the lathes, Fig. 3. Tools then feed down vertical slides to cut off, face and chamfer the end not

chamfered before. Each lathe handles a minimum of 720 bushings per hr.

Two more centerless grinding operations then finish-machine the outside diameter of the bush-



ings. These machines are also automatically hopper fed but together remove only 0.006 in. of metal. After this grinding the bushings are put through a washer and are dried.

At first bushings were bored individually with carbide tools in multiple-spindle vertical lathes using diaphragm chucks. However, since tolerances are close and bushings have to be pressed into holes in the cylinder head anyway, it was decided to do the final boring along the cylinder head transfer line, after the bushings had been pressed into the holes provided for them.

#### **Bushings are hopper fed**

In the cylinder head line, bushings are loaded into the hopper of a press which they feed automatically into eight recesses in line with eight punches. When the cylinder head indexes under the press, all eight punches advance simultaneously and press the bushings into holes previously bored to receive them.

Each punch is made to exert sufficient pressure for a correct press fit. If the fit of any bushing is outside specified limits an indicator light flashes and another bushing giving the required fit is substituted. No cylinder head can be advanced beyond the press station until each bushing hole is filled with a bushing having a proper fit.

After leaving the press station, heads enter the first of two stations where bushings are bored to specified size. Fig. 4 shows the four

boring tools used in the machine at the first of these stations. Each tool holder has two carbide bits and turns initially at 2600 rpm. The boring tool removes 0.015 in. of metal on a side from the bushing hole with boring being done from the valve seat end.

Each of the second carbide bits finishes the valve seat immediately after the bushing hole is completed. During this cut, which is at a larger diameter, the tool is slowed to 1300 rpm or half its former rotary speed. Since both cuts are made by tools in the same holder and in the same press, the cuts are coaxial as required. After one set of four pairs of cuts is made, the cylinder head is indexed to the next transfer station and a duplicate job is performed on the other four valve guide holes and valve seats, the axes of which are at a different angle than are those of the first set.

#### **Reamers in floating holders**

Final boring of the valve bushing holes does not bring them to final size. This is done with carbide reamers that enter all eight holes simultaneously at the final station of the transfer machine, Fig. 5. In the reaming cut only 0.005 in. of metal is removed. Since the reamers are in floating holders the surfaces they produce are in correct alignment with the valve seats. Reaming produces holes of correct size and proper smoothness meeting the required fit with the valve stems which are equally smooth and held with correspondingly close limits.

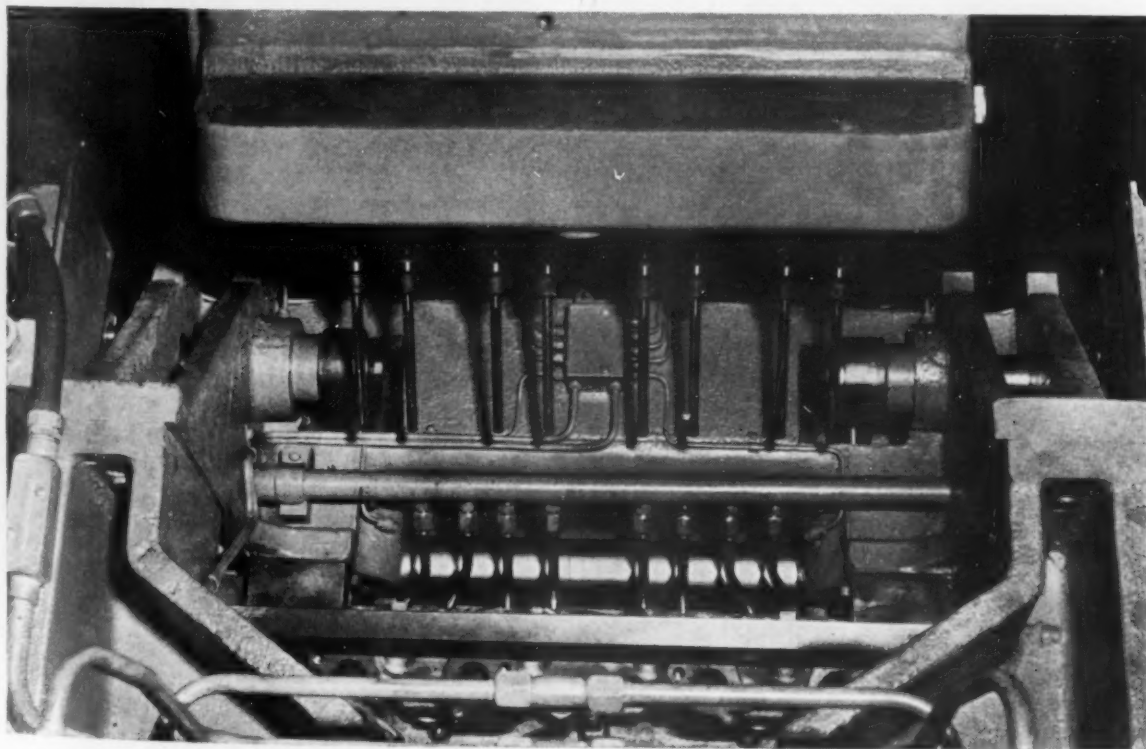


FIG. 5—At this final station of the transfer machine, eight carbide reamers make the final cuts

in valve guide bushing holes of Buick V-8 cylinder heads.

## Firm and permanent—

♦ Adhesives for bonding fibrous glass pads to metal

offer numerous advantages as a fastening method. . . . Pads do not mat or sag, giving uniform insulation over the entire area. . . . Adhesive may be brushed, sprayed or roller coated.

♦ Characteristics of several adhesives vary to suit

particular applications. . . . No expensive tools or equipment are needed for application. . . . Metal surfaces need not be pierced or marred. . . . Bond is firm and permanent.

# ADHESIVES: Agents for Bonding



By W. J. Clayton

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Minnesota Mining & Mfg. Co.  
Detroit

♦ FIBROUS GLASS PADS, bonded to metal, have many uses in metalworking industries for insulation, vibration damping and sound absorption. They offer the advantages of light weight, permanence, flexibility, strength, resilience, usefulness through a wide temperature range and absence of matting or sagging. Of the two basic methods for installing these pads—adhesives and metal fasteners—adhesives are the more versatile and economical for a great many applications.

Adhesives used alone can do jobs where no other form of fastening will serve. They can also be used in conjunction with mechanical fasteners to hold the fibrous glass pad in place until it is permanently secured.

Surfaces of metals must be cleaned thoroughly by abrading, sandblasting, solvent washing or chemical cleaning. Kerosene should never be used. The one exception to the rule requiring clean surfaces is in the automobile industry where removal of the protective oil film or drawing compound from steel roofs would be too time consuming. In this case, Minnesota Mining & Mfg. Co. developed a special adhesive, EC-321, which absorbs oil and increases adhesion to the metal.

Besides being easy to use, adhesives also provide a permanent resilient cushion between the fibrous glass and the subsurface. This cushion often supplements the fibrous glass pad in acting as a partial sound deadener.

Fibrous glass pad consistencies range in density from  $\frac{3}{4}$  to 6 lb per cu ft so that pads may be soft and flexible, or rather hard and rigid. Flexibility decreases as density increases. Thinner, more flexible pads come in roll form while high-density materials are in block or board form. Either type can be easily and permanently fastened with adhesive.

Low-density pads are used in automobile hoods, for insulating quonset huts and other such uses. High-density pads are used on concrete building walls, inside air ducts and similar applications where heavy-duty insulating and deadening pads are required.

Low-density pads,  $\frac{1}{2}$  to 2 in. thick, insulate

the engine compartment of many automobiles and also absorb sound and dampen vibration. This application exemplifies a job where adhesives are the only practical method of fastening. Since the job is done on assembly lines, welding, brazing or soldering mechanical fasteners in place requires special equipment and is time consuming. Appearance rules out use of fasteners which would pierce the hood.

Adhesives for bonding these pads must be sprayable, rapid drying and strong even when wet. They must retain sufficient strength to hold the fibrous glass pad firmly at temperatures ranging from  $-20^{\circ}\text{F}$  to nearly  $200^{\circ}\text{F}$ . For this job, the Minnesota Mining & Mfg. Co. developed a solvent solution of black reclaimed rubber-base adhesive, EC-226, which can be sprayed or brushed, and a water-dispersed black reclaimed rubber-base adhesive, EC-321, which can be roller coated, sprayed or brushed.

The solvent solution is a rapid drying compound which develops a great deal of tack or stickiness and requires pressing the pads into the adhesive within 1 to 2 min. Otherwise, it

becomes too dry to transfer to the second surface. The water dispersed adhesive's paste-like consistency has a relatively long open time of 1 to 10 min. It does not become sticky, but because of its high viscosity has a "muddy" type of strength even when wet, holding the pads in place as soon as the bond is made. It is non-flammable during application.

Buses and trucks are insulated to insure comfort of the driver and passengers. Truck trailer bodies must prevent products in transit from freezing in cold weather or deteriorating during hot weather. Requirements for house trailers are a combination of all these factors.

Light weight and efficiency makes fibrous glass pads well suited and widely used for these vehicles. Although the pads are usually concealed, merely pressing them between structural members is unsatisfactory. Jarring and vibration causes unsecured pads to shake loose and change position, affecting insulating efficiency. Adhesives for these applications are easy to use and do not mar surface appearance.

The pad is coated with adhesive and pressed

## ng Fibrous Glass Pads to Metal



**BRUSHING** does an effective job of spreading adhesive on air-conditioning panels. Pads not only insulate but dampen sound. The bond must also resist moisture.



**INSULATION** gets spray treatment prior to installation in outer jacket of furnace. In addition to good results, it has cut time in half over former fastening method.



### WHY BOND FIBROUS GLASS?

- 1—Adhesives have characteristics similar to fibrous glass itself and hold these properties at all temperatures within the range of the insulation.
- 2—Fibrous glass will not be compressed, allowing complete insulation over the entire area.
- 3—Metal surfaces need not be pierced.
- 4—Insulation contacts entire area and stresses are distributed evenly.
- 5—No danger of cutting through the insulating blanket.
- 6—No expensive equipment is needed.

into place among and around the structural members. Coating the entire surface insures that the pad will be held firmly and permanently in place wherever it contacts a solid backing of metal, wood or other material. Since the adhesive must form an immediate bond and be nonflammable during application, the EC-321 adhesive is used.

Flexible fibrous glass insulation is used extensively to insulate automatic clothes washers and driers against heat loss during operation. In washing machines, the adhesive must withstand temperatures of about 180°F and retain its strength and adhesion under conditions of high humidity. Insulation is pressed into the adhesion within 1 or 2 min after application. The adhesive must hold the pad in place almost immediately. Requirements of good wet strength, good resistance to water when dry, and the ability to withstand the combination of high heat and humidity without losing strength or adhesion make the EC-321 adhesion ideally suited for this job.

### Does triple duty on furnaces

Air-conditioning units use pads for insulating as well as sound or vibration damping. Several types of adhesives are used almost interchangeably in this service. In addition, a water-dispersed low-viscosity rubber and asphalt adhesive, EC-1025, which has good immediate wet strength and is easily applied with a brush, is also used for this purpose.

Fibrous glass does a three-fold job on modern furnaces, it dampens vibration of the sheet metal outer jacket, keeps the outer jacket from getting too hot, and reduces heat loss. Because the insulation used has high density (3 lb per cu ft), a heavy bodied adhesive which dries rapidly and has good immediate strength is required. The adhesive must also withstand comparatively high temperatures without excessive softening or loss of adhesion.

A high viscosity, fast drying material, EC-244, which will not flow up to 250°F and have sufficient immediate strength to hold the high-density pads firmly in place is used for this application. The entire surface need not be covered. Spotting at intervals of 10 to 12 in. is sufficient.

Ducts made of thin sheet metal give rise to two problems—thermal loss and vibration—both of which are eliminated if fibrous glass is securely fastened to the duct work. Adhesives for this purpose give complete contact between the insulating material and the metal. The vibration damping qualities of the pads are fully preserved because adhesives eliminate the danger of cutting through or compressing the material no matter how low its density. The need for piercing duct work is also eliminated and stress is distributed evenly over the entire pad.

High-density fibrous glass insulation, coated with a thin film of rubber to prevent air erosion, is applied to the inside of some high-velocity duct work to dampen vibration caused by the air rushing through the ducts. Low-density material is often applied to the outside of ducts for the same reason. Adhesives are used alone or in conjunction with such mechanical fasteners as clips, tape, staples or cord wrapping for such applications.

### Tank car size poses problem

Adhesives for fibrous glass insulation must be fast setting, provide good immediate strength, be serviceable through a wide temperature range, and be resistant to moisture, vibration, mold and vermin, and be nonabsorbent. Easy application with a brush or trowel is a must. To do this job, a light colored, low-viscosity material, EC-1128, has been developed. It offers a long bonding range, immediate strength, easy handling and a wide temperature range for low-density installations. It is extremely flexible and unaffected by high moisture concentrations even at 210°F. High-density insulations are fastened with the same mastic or high viscosity material used on automobile hoods.

Low to medium-density fibrous glass insulation keeps the temperature in shipboard storage and living compartments from building up as the result of the sun beating down on steel plates. Adhesives which hold the insulation in place must be fire retardent or fire resistant when dry. A solvent solution adhesive, EC-890, for this application provides the necessary immediate and ultimate bond strength, is rapid drying and will not burn when dry.

Metal buildings of the quonset type are another area where fibrous glass insulation is highly effective and can best be applied with adhesive. Completely set-up quonsets can be insulated without loosening bolts or compressing insulation between the beams and outside

skin of the building. A brush is used to apply the adhesive to the metal surface 2 or 3 ft ahead of the fibrous glass blanket roll. The insulation is pressed into contact and held immediately without having any long tail of insulation lying or hanging in the work area.

Railroad tank cars which carry chemical solutions present still another insulation problem. Temperatures of the solutions carried are kept as high as possible to permit a high concentration. Insulation between the inner liner and outer shell is applied to the inner shell and must stay in place while the outer shell is attached.

Size of the tank car presents a problem since the adhesive may stand exposed for as long as 20 min before the blanket is pressed in contact. The bond must also be reliable so that insulation does not lift from the inner shell while the outer shell is fastened. For this operation, a heavy bodied adhesive, EC-194, with high immediate strength provides a good bond up to 20 min after application.

Some installations require a facing material on the fibrous glass pad to improve appearance, insulating qualities, or both. Aluminum foil, vinyl, and laminated kraft paper are the three main facing materials. If a moisture barrier and heat reflector for use at temperatures up to 350°F is desired, aluminum foil is used. If only a moisture barrier is desired for use at temperatures up to 180 to 200°F, a kraft paper laminate will serve well. If a decorative appearance is needed and temperature is not in excess of 140°F, then a vinyl facing is generally used.

Adhesives for bonding these facings to the fibrous glass insulation must be easily applicable by brush, spray, or roll coat and meet these requirements:

For aluminum foil facing, it must withstand high heat and humidity for long periods of

time, retain its flexibility and not deteriorate. For laminated kraft paper facing, it need only to withstand temperatures to 200°F and resist high humidity. For vinyl facing, it may have a low softening point but must not be affected by plasticizing oils in the vinyl or cause staining of the vinyl.

Bonding of aluminum foil facing to fibrous glass is done with a fire retardant adhesive, EC-890. Two adhesives, EC-321 and EC-1025, are suitable for bonding laminated kraft facings. A water dispersed, roll coatable adhesive, EC-1150, which will withstand the action of plasticizing oils and is nonstaining on vinyls meets the requirement of the third facing material.

Two methods are used to tape seams in the insulation where facings do not overlap. Bonding a strip of aluminum foil or vinyl film to the facing with an adhesive, EC-1128, is one method. The other is Scotch Pressure Sensitive Tape No. 430. The tape is foil backed and can be pressed in place over the seam to provide the same protection obtained with a piece of aluminum foil and an adhesive.

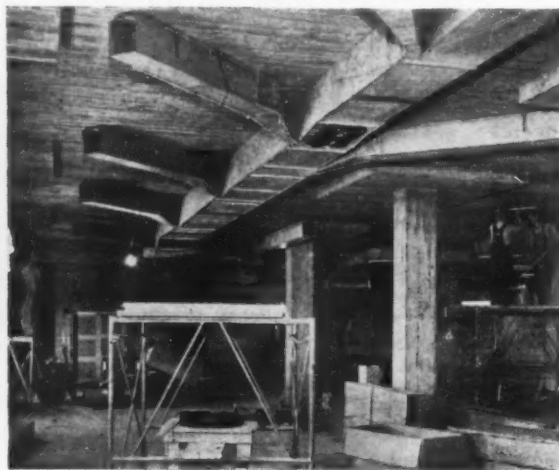
### Avoid excessively heavy gobs

When using a brush, the adhesive should be applied to the structural surface in polka dot fashion. Excessively heavy gobs should be avoided since the adhesive will tend to drip from an overhead surface if too much is applied.

Heavy-bodied adhesives are applied with a trowel to bond insulating materials of high density (3 to 6 lb per cu ft). The adhesive is applied in heavy daubs to either surface being joined with a large putty knife or pointing trowel, then spread with a notched trowel or scraper. This forms small ridges of adhesive and the fibrous glass material is imbedded in these ridges by hand pressure.



FIBROUS GLASS PADS for hood and roof panels of cars are sprayed for immediate bonding in the inverted position. Adhesive must withstand temperatures from -20° to 200°F.



DUCTWORK is insulated by bonding fibrous glass pads to sheet metal with adhesives. Installation is done easily without use of expensive tools or other equipment.

# Safety Features Built Into Sulfuric Acid Pumping System



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**H. B. Pateman**  
Project Engineer

Wigton-Abbot Corp.  
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♦ Fifty to 100 tons of sulfuric acid are used weekly at Rheem's Burlington, N. J. plant . . . Storage and receiving tanks are dispersed over a half mile area . . . Breathing system prevents moisture from reaching inside lines and tanks . . .

♦ SULFURIC ACID in the amount of one to two tank cars per week, each of 50-ton capacity, is used at the Burlington, N. J., plant of Rheem Mfg. Co. for pickling of steel and brass in a great number of machines and also for the adjustment of alkaline wastes. To handle this volume, an extensive distribution system was recently designed and built by the Wigton-Abbot Corp. Use of plain carbon steel in applications normally requiring alloy steels resulted in considerable savings in construction costs.

Storage and receiving tanks are dispersed in a large area,  $\frac{1}{4}$  of a mile in diameter, partly under cover and partly outdoors. Storage tanks are not in the center of this area but on the periphery, making feed lines necessarily long. These lines had to be arranged overhead and therefore special safety measures had to be taken. From the feeding lines acid goes directly to the pickling machines or to measuring tanks located above the machines. Measuring tanks have capacities ranging from 50 to 200 gal.

To achieve savings, plain carbon steel was used for the construction of storage tanks, pipes and measuring tanks. For pumps and valves, however, special austenitic stainless steels that contain high percentages of nickel, chromium and low carbon content were used. The difference in composition of the alloy steels used for pumps and for valves is shown in the analysis table. Alloy steel was used to prevent corrosion should the acid leak around the shaft of the pump or stern of the valve and be diluted by rain or by moisture from the air.

Acid from the storage tanks is pumped to the production area via a  $\frac{1}{2}$ -mile long recirculation line. As shown on the flowsheet, p. 165, this line delivers acid to measuring and pickling tanks and after completing the loop returns to storage tanks. The valves through which the line returns to the storage tanks are kept open so that acid recirculates freely in the line, without causing any unnecessary pressure buildup.

Pumping of acid for refilling the measuring tanks and pickling machines is done mostly on weekends when the metal plant is not working. After pumping is finished, acid from the recirculating line will drain back to storage tanks by gravity since the overhead line is pitched so that acid will flow from the highest point in the line, see flowsheet.

This design feature keeps the overhead line in the production area empty of dangerous acid during the time when hundreds of operators are working in the metal plant. In case acid has to be pumped to the production area during weekdays and the draining of the acid from the lines has to be accelerated, a provision was made to use the pumps in such a way that the flow of acid in the recirculation line is reversed and acid can be sucked out from the line very quickly. This is done by opening bypass No. 4 shown on the flowsheet.

Another feature of the design is the breathing system. It prevents any moisture from reaching the inside of the recirculation line and measuring tanks. As stated above, the lines and the tanks were made of carbon steel so that no moisture from the air should enter the lines or measuring tanks, where it could dilute the acid and form a corrosive mixture.

The  $1\frac{1}{2}$ -in. diam breathing line is located a few feet above the recirculation line. The breather line is interconnected with the storage tanks, measuring tanks and recirculating line. Air that is being displaced by the acid, or vice versa, is contained in the system and hence is fully dry. When acid is pumped to the measur-



ing tanks, displaced air from the tanks moves over the breather lines to storage tanks where it displaces acid.

The only free communication between the internal air contained in the breathing system and the outside air is by vents on each storage tank, see flowsheet. The vents are made of 2-in. pipes, curved down and fully open to the atmosphere. There is some movement of air from and into the tank due to changes in outside atmospheric temperature and also when filling the storage tanks with fresh acid or when pumping acid to the pickling machines.

Outside air is moist and in some other sulfuric acid storage tanks, the vents are provided with a desiccant that removes moisture. In this case no moisture removing agent is used since concentrated sulfuric acid is itself one of the best desiccants.

Steel as material of construction is attacked by sulfuric acid when the dilution reaches 90 pct or less. Concentrated acid 66° Be contains 93.19 pct of acid and if the storage tank for example is half full the time required for dilution of the acid by moist air to corrosive strength is very long under even the most adverse conditions.

During a long shut-down period when acid from the storage tank is not being pumped away, a thin layer of diluted acid may form on the surface of the concentrated sulfuric acid causing corrosion. To avoid this during

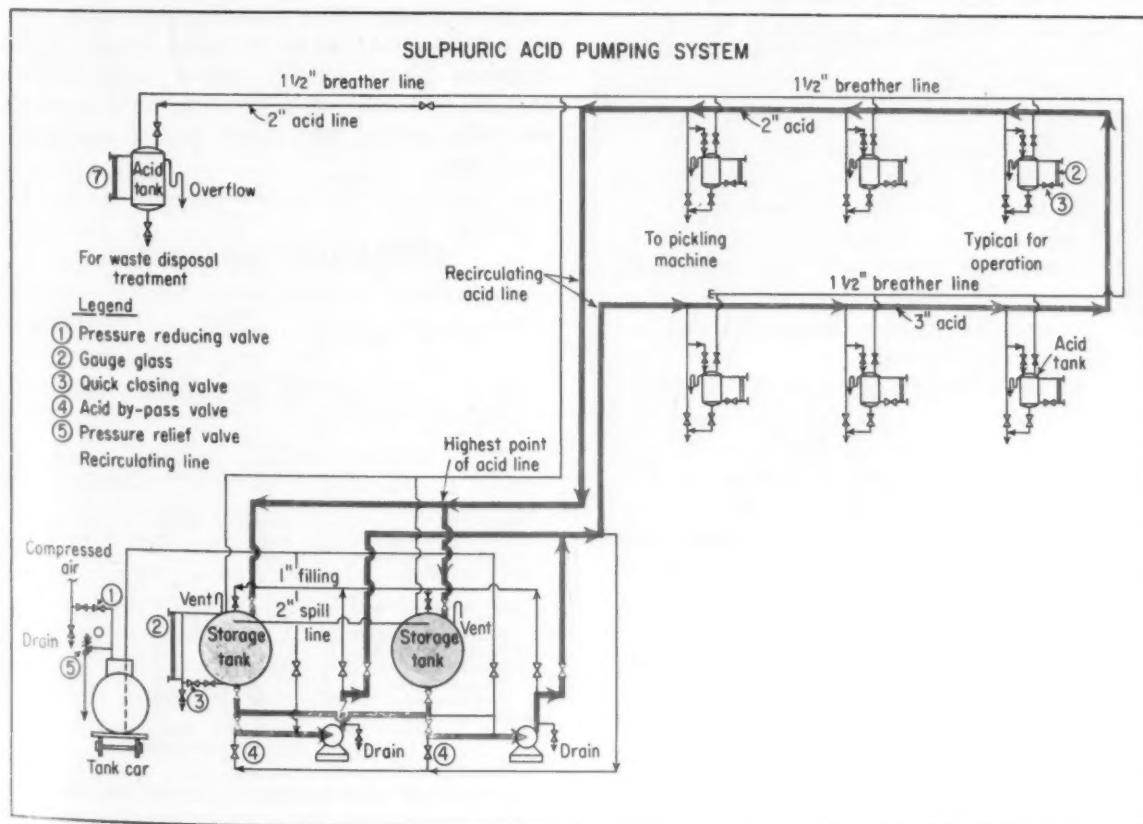
## ANALYSIS OF ALLOYS IN SYSTEM

	PUMPS	VALVES
Chromium.....	20.0	19.0-21.0
Nickel.....	24.0	29.0-30
Molybdenum.....	3.0	2.0-3.0
Silicon.....	3.25	1.5 max.
Copper.....	1.75	3.5-4.5
Manganese.....	0.6	0.65-0.85
Carbon.....	0.07 max.	0.07 max.

shut-down periods operators circulate acid at regular intervals.

Both pumps serve a dual purpose—either for pumping acid to the production area, or for pumping acid from the tank car. When pumping from a tank car the total dynamic head of the pumps is much smaller than when pumping acid to the production area. To prevent the pumps from pumping too much acid at low total dynamic head and thus injuring the motor, the diameter of the discharge line from the pump to the storage tank was reduced to 1 in.

Tank cars may be unloaded by applying air pressure in accordance with the recommended practice for unloading sulfuric acid. In this case dry air of not over 30 psig is used for repressuring the tank car. At Rheem, however, greater safety called for using pumps for unloading the tank cars. Enough acid is left in the suction lines so that the pumps can pick up suction of the acid from the tank car even without the initial repressuring with air.



# SPECTROCHEMICAL TECHNIQUES ADVANCE TITANIUM TECHNOLOGY



By J. T. Rozsa

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National Spectrographic Laboratories, Inc.  
Cleveland

♦ **RECENT DEVELOPMENT** of production methods for titanium has stirred a keener interest in analytical control methods. Use of the emission spectrograph, aided by improved techniques for producing standard samples, overcomes previous difficulties and meets the analytical requirements for this new metal. Applied successfully to the development of beryllium, zirconium and uranium, this method of analysis provides the necessary flexibility, precision and speed.

The spectrum of titanium, like that of iron, is complex and requires the use of high dispersion spectrographs. Spectral lines which require the presence of a strong electrical field (high excitation potential) dominate in the metallurgical range of 2200 to 3600 Å (Angstrom units). For this reason, excitation must be both precise and flexible. Laboratory equipment for analysis of iron and steel should be satisfactory for titanium.

In production analytical control, the best sample for convenience and speed in spectrographic analysis is a solid material which can be machined or ground to provide a flat surface. The electrical discharge in conventional point to plane excitation then occurs between the sample surface and a pointed carbon rod. When a material is suspected of heterogeneity, it is well to use small diameter chill pins.

Larger sizes permit use of a single analytical scheme in which reasonable changes in the size of the sample do not necessitate different intensities of excitation or changes in line pairings. Nondestructive testing of finished and semifinished parts is thus possible for metal-

lurgical reasons, mixed stock or segregational studies.

Early work on commercially pure titanium granules or millings had shown that 15-mg samples often gave inaccurate and misleading analyses. When these materials were made into rolled sheet, iron determinations were very erratic. Chemical analysis of material within sparked areas confirmed the existence of segregation which was responsible for lack of precision.

Titanium alloys gave a different pattern and it appeared that heterogeneity had been greatly reduced. In one case, mill analysis of titanium samples with high concentrations of vanadium, while correct, did not represent all parts of the heat in fabricated form. These 1-in. rounds in repetitive sparking gave consistent results, but varied from 3 to 15 pct from mill analyses.

Several 3-in. round cross-sectional pieces, when sampled from edge to middle, also exhibited little change in analysis. Random bar stock samples of alloy 130 A showed greater difference from end to end than on the cross-section. While titanium alloys exhibit severe segregation, samples are sufficiently accurate for inspection analysis, sorting and other similar analytical problems.

TABLE I  
**EXCITATION PARAMETERS**

METHOD →	FUSION TECHNIQUE		SOLID METAL TECHNIQUE
	Residual Elements	Alloying Elements	Alloying Elements
	Ignited 110-v, ac arc	ac spark	ac spark
Secondary:			
Peak voltage.....	8,000	16,000	12,000
Capacitance, microfarads.....	0.001	0.010	0.0012
Inductance, microhenries.....	200	4.0	0
Resistance, ohms.....	0	0	0
Amperage:			
Alternating-current, spark (R. F.).....	0.1	19.0	4.2
Alternating-current arc.....	5	.....	.....
Discharges per half cycle.....	1	7	12
Exposure Time:			
Pre exposure, sec.....	2	0	40
Total time, sec.....	90	180	70
Analytical gap, mm.....	2	2	2
	self electrodes	self electrodes	point to plane

Spectrograph type: Littrow; lens focused upon collimator; 16-micron slit.

◆ One of the newer scientific instruments, the emission spectrograph, used successfully in development of beryllium, zirconium and uranium, now meets the analytical requirements for titanium . . . Aided by improved techniques, analysis is flexible, precise and fast.

◆ Accurate standard samples can be made by the fusion technique commonly used in chemical decomposition of titanium ores . . . The method is adaptable to various metal forms . . . Solid samples are satisfactory for production analytical control.

At first, drillings were more available than any other form of sample. These drillings were briquetted in a hydraulic press to  $\frac{1}{2}$ -in. diam tablets. Working curves were about the same as for solid samples but the lower precision obtained from briquettes was noticeable. Precision seemed to be a function of particle size, and with many fine powders of minus 200 mesh, results were as good as for solid samples. When subjected to experimental powder metallurgical techniques of compacting and sintering, these powders gave solid samples of unusual homogeneity which would form the basis of excellent standards.

Solid samples were a diversified mixture of rods, billet slices, sheet stock and vacuum cast cylinders. Alloys with up to 7 pct of various elements required a spark discharge in which the duration of the transient, or individual spark, was maintained at 6 microseconds.

#### More flexible method sought

The chief difference from steel was the very low heat conductivity of titanium. This lack of thermal capacity incurred variations of the rates in which elements are evolved into the arc column, including the extreme case of fractional distillation. It was necessary to reduce the average secondary high-frequency amperage of the alternating current spark unit to about 4 amp. Discharges per half cycle were increased to ten or more to obtain a brush-like discharge over a large and uniformly worked area.

One difficulty peculiar to steel alloys is the lateral shift of all element working curves when more than 0.50 pct aluminum is present. This is also true of titanium alloys since aluminum is often a major element. A low-inductance spark discharge minimizes this condition but a separate set of curves should be used. An increase of aluminum from 0.50 to 5.00 pct does not exhibit a reduction in intensity of the titanium spectral lines. Usually, the error incurred by aluminum is about 3 to 10 pct.

Residual element working curves did not seem to suffer due to the moderate alloying amounts used. Typical repeatability as a measure of accuracy was about 2 pct of content for man-

ganese, chromium, vanadium and molybdenum.

The point to plane technique will undoubtedly have greater utility but because of current lack of standards and nonstandardization of alloy types, a more flexible method was sought.

Five common spectrographic solution techniques—porous cup electrode<sup>1</sup>, Lucite cup electrode<sup>2</sup>, graphite cup electrode, Bakelite resin-coated graphite electrode<sup>3</sup> and copper rod electrode<sup>4</sup>—were investigated. Each was limited by one or more of five factors.

The final approach was the fusion method commonly used in the chemical decomposition of titanium ores. This investigation was biased toward the fusion technique of Nachtrieb, Johnson and Dress<sup>5</sup> because of the thousands of satisfactory determinations made during the past few years. It was thought that this alternating current arc excitation could be adapted



**FUSION METHOD** of producing standard samples for spectrographic analysis of titanium is flexible and precise. Dipping electrodes to coat ends requires considerable skill.



**In the fusion method, titanium chips are carefully mixed and 400 mg placed in a large crucible made of platinum . . .**

to an alternating current spark type to broaden the range of elements and to obtain high precision particularly at high alloying concentrations.

In the fusion method, titanium chips are carefully mixed and 400 mg placed in a large platinum crucible. About 25 ml (1:4) sulfuric acid plus two drops of hydrofluoric acid are added and heat applied gently until the metal dissolves. The solution is then carefully evaporated to near dryness. Nine grams of potassium pyrosulfate is then added and the mixture brought to a clear molten swirling fusion over a gas burner.

When the sample is in the form of fine drillings, preliminary digestion with sulfuric acid is usually unnecessary. Similarly, other titanium salts such as oxides, sulfates and ores are fused directly with potassium pyrosulfate in the ratio of 22.4 of potassium pyrosulfate to 1 of equivalent metal.

While the solution is still molten, the flat ends of preheated pure 3/16-in. diam. graphite electrodes are immersed slightly into the melt. The excess is shaken off and a thin adherent coating is obtained. To correct for various depths of dipping, the electrode is placed in a lathe and 0.003 in. is machined from the electrode wall. Samples are then ready for spectrographic excitation.

Manipulation in coating electrodes is an

art which can be mastered with practice. As an alternative method, a small portion of the melt after swirling is cast on the platinum cover and allowed to cool. It is then crushed with a spatula and ground to a fine powder in a dental amalgamator in 1 min. A 10-mg charge is then mixed with graphite powder in the ratio of 1:1 by weight. The mixture is placed in a 3/16-in. diam undercut electrode and excited in a direct current arc where the sample becomes the anode.

One of the major elements, silicon, is not amenable to this treatment. A sodium carbonate-borax fusion is adequate for silicon determination without further changes in technique.

Because titanium has high spectral line count, it was necessary to use a spectrograph with high dispersion compatible with rapid evolution of impurities from the solid into the arc column. A large quartz Littrow prism spectrograph was satisfactory. Excitation parameters are given in Table I. Analytical spectral line pairings, primarily of the alloying constituents, are listed in Table III.

#### **Selection is difficult**

Selection of analytical line pairs is tedious and difficult particularly on a new material because experience-derived homologous pairs are unavailable. To be homologous, the analytical element line and the internal standard line must be so chosen that the ratio of their radiant flux has minimal change with variations in the excitation conditions. Through the efforts of W. F. Meggers<sup>6</sup>, C. E. Moore<sup>7</sup>, J. Convey and J. K. Hurwitz<sup>8</sup>, selection of homologous spectral line pairs is possible by means of their excitation potentials.

#### **Variations in side coating**

If the excitation potentials are known, self reversal in which radiant power becomes absorbed at the center of the emission lines may be foreseen and matched spectral lines would behave equally regardless of source fluctuations. The alloy line pairs given in Table II were chosen by such a procedure.

The potassium ion serves an important function other than its part in the fusion medium. The effective ionization potential of gas in the arc column depends on the ionization potential of each constituent. The element of lowest ionization potential assumes the dominant role. Since the ionization potential of potassium is 4.3 ev (electron volts) as compared to 6.8 ev for titanium, 7.9 ev for iron, 6.18 ev for chromium and 7.4 ev for manganese, energy of excitation is stabilized at that of the

TABLE II

#### **ANALYTICAL LINE PAIRINGS FOR SOLID SAMPLE TECHNIQUE**

Element	Spectral Line	Excitation Potential	Range, pct	Concentrational Index
Ti	2644.234 3038.706	4.69 12.45	Internal Standard	
Al	3092.713	4.00	0.30 - 3.40	1.42
Cr	2835.633 2822.371 3021.568	12.60 14.68 4.17	0.10 - 1.00 1.00 - 4.00 4.00 - 11.00	0.31 1.90 7.50
Cu	3273.962	3.77	0.005 - 0.023	0.011
Fe	2599.396 2598.369	12.63 12.64	0.02 - 0.50 0.50 - 3.00	0.16 1.12
Mg	2802.695 2852.129	12.01 4.33	0.0006 - 0.004 0.004 - 0.06	0.0013 0.02
Mn	2593.729 2889.580 2886.678	12.16 15.76 15.78	0.02 - 0.45 0.45 - 4.00 1.00 - 10.00	0.11 1.75 4.30
Mo	2848.232 2775.400 3170.347	11.80 13.23 3.89	0.40 - 1.50 1.00 - 5.30 2.00 - 9.00	0.68 2.54 4.40
Si	2881.578	5.06	0.07 - 0.50	0.23
V	3093.108 3276.124 3267.702 3094.199	11.09 11.60 11.55 13.73	0.10 - 0.50 0.40 - 1.10 1.00 - 2.20 2.00 - 5.00	0.26 0.65 1.37 3.05

TABLE III

### ANALYTICAL LINE PAIRINGS FOR ALLOYING ELEMENTS (Fusion Technique)

Element	Spectral Line	Spectral Line Classification	Excitation Potential	Range, pct	Concentrational Index
Ti	2599.9	I	4.75	Internal Standard	....
	2572.7	II	12.00*	Internal Standard	....
Al	3082.7	I	4.00	0.5 - 1.5	0.75
	3082.2	I	4.00	1.0 - 4.0	1.33
Co	2559.4	II	14.06	1.0 - 8.0	2.77
Cr	3021.6	I	4.17	1.0 - 7.0	3.15
Fe	2599.4	II	12.63	0.05 - 0.49	0.14
	2598.4	II	12.64	0.40 - 2.00	0.86
	3020.6	I	5.11	1.7 - 6.5	4.05
Mn	2896.7	II	12.77	1.0 - 5.4	2.25
Mo	2672.6	II	13.59	1.0 - 10.0	6.50
V	3093.1	II	12.74	1.4 - 10.0	4.50
	3185.4	I	3.90	4.0 - 10.0	6.00

\* Approximate.

potassium ion. Such stability greatly improves analytical accuracy.

A high-voltage (4800 to 2400 v) alternating current arc is not recommended because of the high incidence of wandering. Until a good technique of coating electrodes is achieved, variations in side coating will occur. With high-voltage arc wandering, undue emphasis is placed on side coatings. This can be minimized by use of a spark-ignited alternating current

arc or a spark-ignited unidirectional arc which centers the arc column.

Any desirable method must necessarily encompass (1) sensitivity for a large number of the elements, (2) precision for high impurity or additive ranges, (3) amenability to synthesis, (4) requisite speed and (5) minimization of heterogeneity of the material. Accordingly, validity of the fusion technique was evaluated by these criteria.

The ignited alternating current technique was suitable for about 30 elements listed in Table IV. A powerful high-inductance alternating current spark discharge will offer similar sensitivities if background correction is made. The secondary amperage required is about 13 amp and inductance is 300 microhenries.

Greater sensitivity can be obtained with the direct current arc for tantalum, wolfram, boron, cobalt, phosphorous and zinc. Ability to analyze low amounts of barium and lead is thought to be due to mechanical entrainment rather than limited solubility.

Precision of the method is shown in Table V. The low chromium figures represent a criterion of accuracy for low concentrations because they represent the same sample sent in at various intervals over a 2-year check. The antimony figures represent analyses from individual samples taken from the same lot of material.

Analysis of iron, which was difficult for



EXCITATION OF SAMPLE in a high dispersion spectrograph is necessary for compatibility with

high spectral line count of titanium. About 30 elements can be analyzed in 1 hr.

**Since titanium oxide can be obtained in very pure or analyzed form, it can be used as a basis for synthesization . . .**

solid material because of attendant segregation, was now suitable with adequate precision.

A major advantage of the fusion method is the ability to make accurate standard samples. Since titanium oxide can be obtained in very pure or analyzed form from the Bureau of Standards and Titanium Pigment Co, the oxide serves as the basis for synthesization. For those elements present in unknown percentages, the method of successive approximations by additions<sup>9</sup> will suffice.

Solutions of pure elements can be titrated into the crucible, dried, and fused with titanium oxide and potassium pyrosulfate without preliminary chemical digestion. Such a method permits the investigation of a wide variety of elements at specific levels of concentration,

Storage of standards for specific elements requested repetitively may be realized by stock liquid solutions or stock solid solutions. Prefused concentrated standards in potassium

TABLE IV  
**TYPICAL SENSITIVITY**  
Ignited AC Arc Excitation  
(Fusion Technique)

Element	Spectral Line	Sensitivity
Ti	2933.55	Internal Standard
Ag	3280.68	0.001
Al	3092.71 3944.03	0.005 0.001
As	2288.12	0.005
Ba	4130.66	0.001 - 0.01
Be	2348.61	0.001 or less
Bi	3067.72	0.005
Ca	3179.33 3933.67	0.01 or less 0.001 or less
Cb	3094.18	0.005
Cd	2288.02	0.001
Ce	3453.51	0.015
Cr	2835.63	0.01
Cu	3273.96	0.001 or less
Fe	2589.68	0.0001
Hf	2641.41	0.01*
La	3995.75	0.01*
Li	6707.84	0.01*
Mg	2795.93	0.0001 or less
Mn	2576.10	0.0005
Mo	3132.59	0.005
Na	3302.32	0.02
Ni	3414.77	0.005
P	2553.28	0.20
Pb	2833.07	0.001 - 0.01
Sb	2598.06	0.01
Sn	2706.51	0.03*
Sr	4077.71	0.001
V	3183.98	0.001
W	2586.94	0.10
Zn	3345.02	0.15
Zr	3273.05	0.001

\* Approximate.

TABLE V  
**PRECISION EVALUATION**

Sample Identification	Element Determined	Average Concentration	Standard Deviation
A	Cr	0.0033	5.1
B	Cr	0.0090	4.7
C	Sb	0.22	3.8
D	Ce	5.00	1.8
E	Mo	1.01	1.8
F	Fe	2.00	2.0
G	Al	2.02	2.5
H	V	5.00	1.8
I	Cr	2.40	2.1

pyrosulfate may be kept indefinitely in stoppered bottles without deterioration. The method is hence adaptable without change to oxides, sulfates, dissolved metal forms (sponge, granules, as-cast, rolled, ingots, etc.) and other chemical forms.

If vacuum furnace production is contemplated, a complete set of metal cast standards can be initiated and calibrated completely by the spectrographic fusion method with accuracy and low cost.

After the method has been placed in service, it is possible to analyze for about 30 elements quantitatively in 1 hr. With batch analyses, the time per sample is lowered appreciably.

The normal base sample of 400 mg can easily be extended to 1 g or larger if segregation is unusually severe. Composite samples for over-all ingot analysis evaluations are possible.

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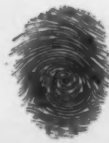
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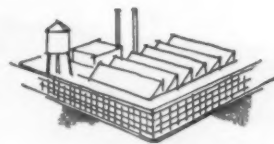
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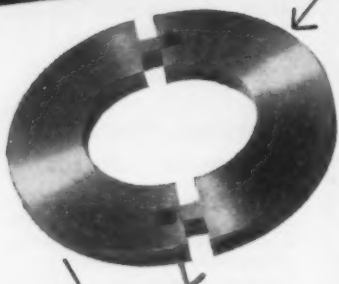
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## Technical Briefs

Engineering

### METHODS:

Proper cutting of new abrasive drum covers keeps costs down.

Improper cutting of spirally wound abrasive drum covers used in many metalworking shops for grinding and polishing sheet and strip can build up cover costs and cut machine efficiency. Abrasive stock can be saved and machine efficiency improved by following standard procedures.

There are two basic types of spirally-wound drum machines in use. On one machine the coated abrasive cover is butt-wrapped on a smooth drum. On the second, the abrasive cover is overlapped along the spiral.

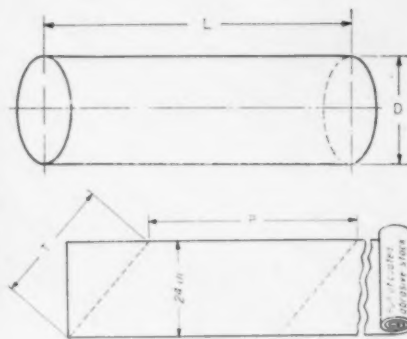


FIG. 1—Basic measurements are taken from the length and diameter of the drum. P equals the area of the drum divided by the width of the abrasive sheet. T is diameter of the drum multiplied by 3.14.

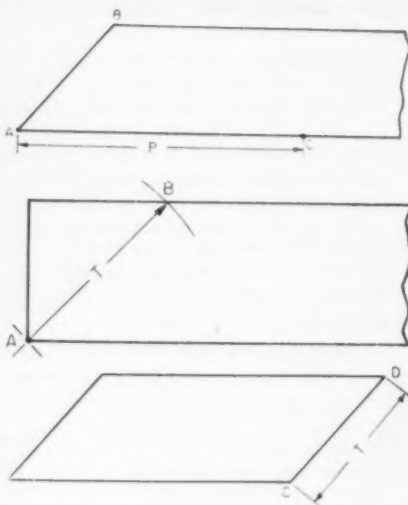


FIG. 2—Calculated factors T and P are used for layout on the abrasive sheet to give proper cutting marks. Make cuts from rear of sheet to save wear on knife.

### IF YOU WANT MORE DATA

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The drum on the second machine has a spiral groove on its surface to allow for the double thickness of coated abrasive. On both types of machines the abrasive cover is clamped at both ends of the drum with a suitable take-up device to keep the cover snug on the drum surface.

### Most Use 24-in. Roll

Practically all of these drum sanders are designed to use 24-in. wide rolls of coated abrasive, either paper, fiber, or clothbacked, or with combinations of these materials. Because the diameter and length of the drums vary according to manufacturer, the abrasive covers must be cut to fit the individual machine.

Measurements must be made on the spot or from specifications written for the particular model involved. Basic drum dimensions, are length and diameter, Fig. 1. Basic dimensions for the coated abrasive cover are the length of the taper (T) and the length of the cover (P). Both dimensions will be determined in inches.

### Making the Calculations

Butt-wrapped spiral covers:

1. Calculate area of drum (AD) to be covered.

$$AD = \text{length of drum (L)} \times \text{diameter of drum (D)} \times 3.14$$

2. Calculate length of abrasive cover (P)

$$P = \frac{\text{area of drum (AD)}}{\text{width of coated abrasive (24 in.)}}$$

3. Calculate length of angle cut or taper (T)

$$T = \frac{\text{diameter of drum (D)} \times 3.14}{2}$$

## Production Ideas

4. Knowing the length of angle cut (T), scribe an arc with a string or rule of radius T from one corner (A) of the coated abrasive until it intersects the opposite edge (B) of the coated abrasive as shown in Fig. 2. Cut the cover (from back-side) on a straight line (AB) between the two points.

5. Measure off the calculated length Fig. 2 of the cover (P) along the edge of the coated abrasive (AC).

6. Repeat (d) scribing arc of radius T from point C on Fig. 2 to locate point D. Cut straight line CD.

After initial cover has been cut from a roll of coated abrasive, each cover after that is cut by merely repeating steps (5) and (6).

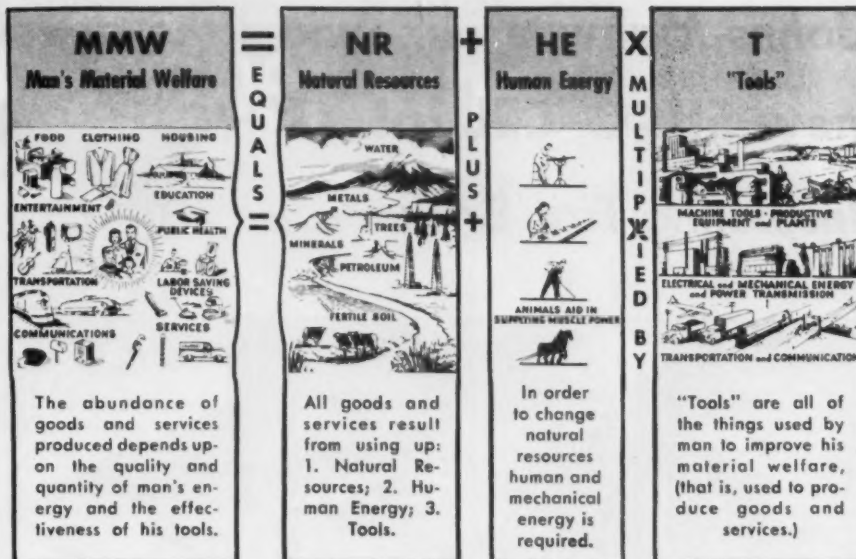


FIG. 3—Rolls of coated abrasive stock for drum sander are usually kept on vertical rack. Portable table simplifies cutting.



FIG. 4—Coated abrasive cover is spiral wound onto cast iron roll. Here seams are butted, not overlapped.

Turn to Page 176



## Wherein Lies America's Greatness?

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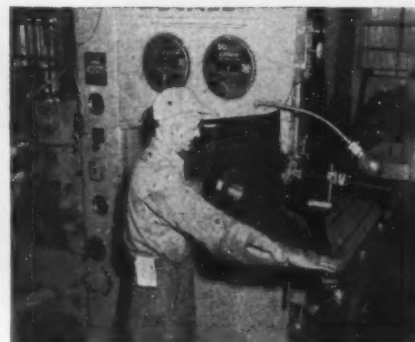
But China and Russia have more population and vast untouched resources.

Inventiveness? Marconi, an Italian, invented the wireless but we have more radio sets than the rest of the world combined. The English pioneered television but we put it in millions of homes. The Diesel engine came from Germany, but we put it to widespread use.

Secret to our high living standard and abundant accumulation of goods lies in our greater use of tools. Man's material welfare is a direct reflection of his use of tools to multiply his own energy.

America's great use of tools is a result of its economic system of free, competitive enterprise. To survive and prosper in a competitive economy a manufacturer must constantly strive to increase his efficiency and productivity by use of better tools. To buy these tools he needs money. Our system provides for that, too. It provides the possibility of financial gain to the man who saves and invests part of his earnings and thereby supplies funds for people who have none.

Every idea for changing our system such as Government ownership, profit limitations and others has been tried in some other country at one time or another. In every case these other systems have not only failed to provide the tools and productivity for the promised standard of living, but also frequently have taken away the people's personal freedom.



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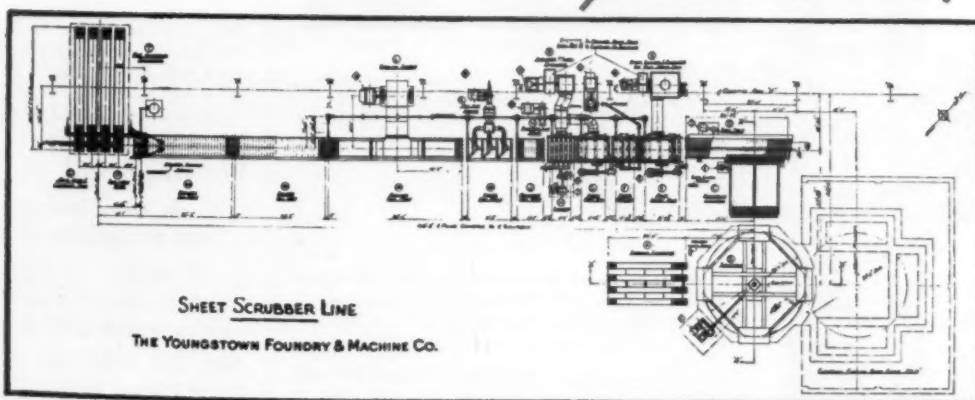
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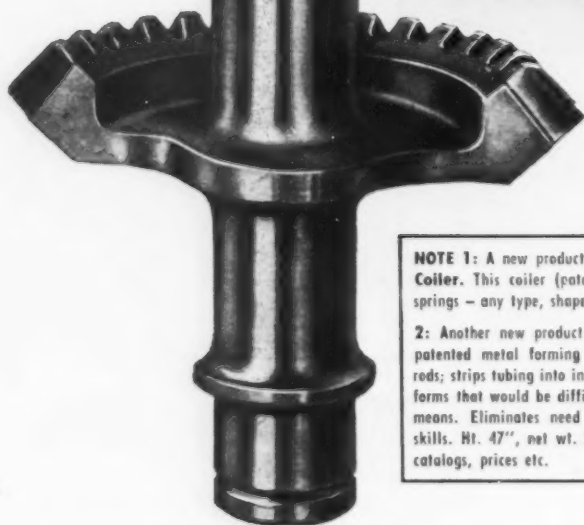
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## Technical Briefs

### Overlapped Spiral Covers

First calculate theoretical circumference of drum (CT) and length of angle cut or taper (T).

$CT = \text{diameter of drum (D)} \times 3.14 + \text{width of overlap}$   
(Measured parallel to edge of drum)

also,  $T = CT$

1. Calculate area of drum (AD) to be covered.

$AD = \text{length of drum (L)} \times \text{theoretical circumference (CT)}$

2. Calculate length of abrasive cover (P).

$P = \frac{\text{area of drum (AD)}}{\text{width of coated abrasive (24 in.)}}$

3. Knowing T and P, follow steps (4), (5) and (6) given previously for butt-wrapped covers. Covers are cut and applied as shown in Figs. 3, 4 and 5.



FIG. 5—Clamps on each end of grinding roll hold cover in place. A rubber faced steel roll, directly under grinding roll, backs up work being ground and helps maintain accuracy of finished thickness.

### CARBIDES:

Tough teeth for coal mining tools help cut industry costs.

Cemented carbides, among the hardest metals made by man, have helped cut mining costs by extending life between sharpenings of the cutting tools used by modern coal mining machinery.

Continuous mining machines, the heart of the industry, depend for efficiency on the cutters used. The only contact the equipment

Turn to Page 178



## He's Machining Scrap Material... at \$2.25 an Hour!



Who ever heard of machining scrap? Sounds silly on the face of it—yet countless companies admit wasting money in just this way every day: Spending hours machining and finishing parts from initially defective material—only to have them scrapped at final inspection; tying up production machines—squandering man-hours to no avail!

All this happens because of invisible cracks and defects which go undetected through stage after stage of processing, right to the end of the line!

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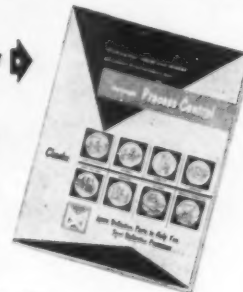
### PROCESS CONTROL—through Methods by Magnaflux—



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- Detects defective parts or materials at a point where it costs least to reject them.
- Reveals operating trouble in processes or tools at first occurrence, so they can be corrected.
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Wapakoneta, Ohio

## —Technical Briefs—

actually has with the coal is through the cutters.

### Determining Factor in Costs

The mining tool is often the determining factor in reducing and increasing production costs per ton.

In considering tungsten carbides, the coal industry's problem is similar to that of the metal-working industry 25 years ago. It must find a tool material which will increase production and not proportionately increase costs.

### Outlasts Steel Bits

Examples of service with carbide tipped rock bits are shown in the illustrations. A multiuse steel, a tungsten carbide-tipped bit after 250 ft of drilling, and a new bit tipped with carbide are compared. The steel bit wore off gage after drilling only 2 ft of granite. The carbide bit drilled 60 ft and, after five regrinds during which it covered 250 ft, was still on gage.

Tools must be properly ground at the right time for best service.

Savings to be made through use of carbide mining tools vary with the type of seam cut. In some cases, as measured by recording instruments, 25 to 40 pct less power was required.

### Save Man, Machine Time

Records show steel tools cutting  $\frac{1}{2}$  of a place and carbide tools cutting as high as 40 places in the same seam. This alone, of course, is a tremendous saving in man and machine time.

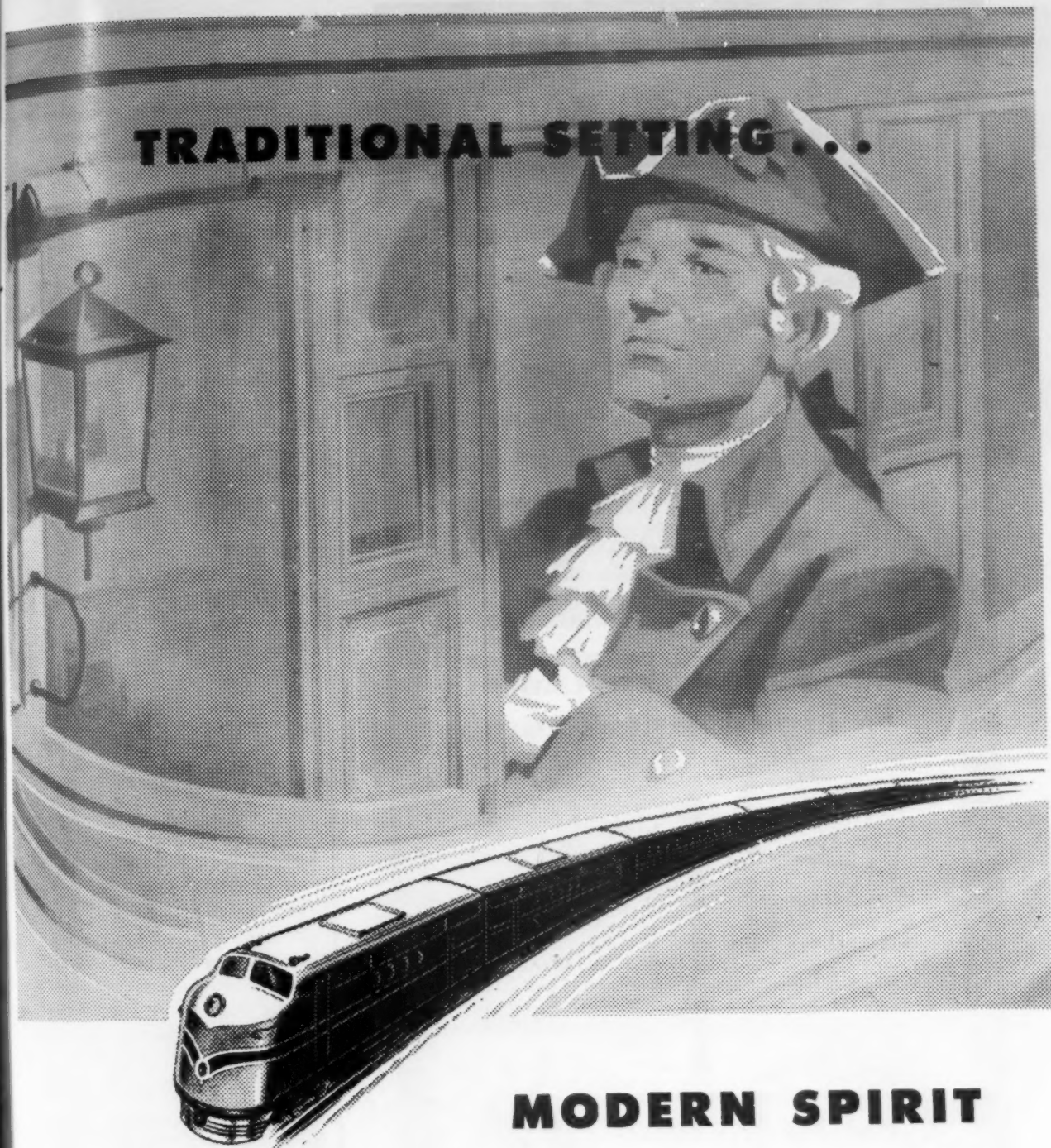


ROCK BITS, compared are new bit with carbide tip, left, similar bit after 250 ft of drilling, and steel bit after use. Steel bit wore off gage after 2 ft of drilling in granite. Carbide bits retained gage size even after five regrindings and 250 ft of drilling.

Turn to Page 180



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## Technical Briefs

### RESEARCH:

Combustion flow phenomena in jet engines studied at Wisconsin.

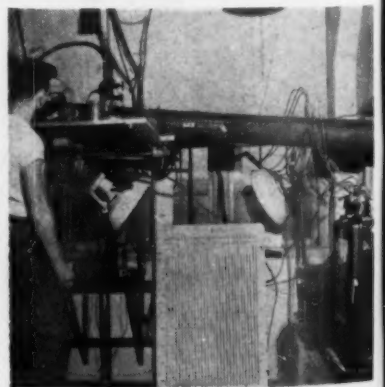
The jet planes thundering across the skies have a hidden "howl" which the ground observer doesn't hear. But the noise bothers pilots plenty. When it comes it signals peak power performance of the engine, that it is at a "strain" level, that here the engine could fail and even go to pieces.

With a jet power setup in the engineering laboratories at the University of Wisconsin, two engineering professors and a graduate student assistant are producing jet engine temperatures, that reach upwards of 3500°F, and a jet "howl" that makes you deaf in a few minutes. They're studying that hidden howl and exactly what effects the heavy oscillation vibrations that produce it have on jet engines and power.

### Depends On Combustion

The research program involves the study of steady flow combustion phenomena—that is, the flow of fuel and air into the combustion chamber and its explosion when ignited—in a jet engine.

The hidden howl itself is technically known as a variable frequency pressure oscillation in the gas stream, frequently reaching high amplitude noise and vibration levels in the engines. It has been established by engineering researchers that the "howl" condition is dependent upon the combustion process.



JET COMBUSTION flame is checked by research engineer at University of Wisconsin. Flame in combustor pipe is watched through small quartz window. Manometer board indicates pressure throughout pipe, and gas temperatures are recorded, right.

Turn to Page 183

## Technical Briefs

ess, but its exact mechanism is as yet unknown.

### Reach Resonant Frequency

Recent data obtained on this project have indicated that there exists at all times in steady jet engine fuel-air flow combustion a flame temperature oscillation, its amplitude and frequency being dependent upon the fuel-air ratio. These temperature oscillations may reach frequencies comparable to the resonant frequency of the exhaust system or other mechanical parts, resulting in a very noticeable rise in "howl" amplitude and engine vibration.

At the present time, research at Wisconsin is being conducted in an effort to ascertain the effect of inlet fuel conditions on these flame temperature oscillations, the Wisconsin researchers explain.

### Get Flame Data

It is hoped that the results of these studies will shed further light upon the origin of the second hidden "howling" combustion and its linkage with the gas stream, they say. They hope that it will show the way to a more effective fuel-air ratio for jet engines, to gain the most powerful performance possible with the least howl and engine vibration.

### Mounted In Pipe

The Wisconsin research is being conducted on a single jet engine "combustor can" mounted in a pipe through which air is forced. Air flow is supplied by a supercharger driven by a war-surplus aircraft engine.

## WELDING:

**Giant steelmill pipe joined with novel traveling fixture.**

Large pipe used in steel mills to carry coke-oven gas to preheat furnaces, openhearth and soaking pits is welded by the Jennings Mfg. Co., Masbury, Ohio, with an unusual Unionmelt welding setup.

First, low-carbon steel plate  $\frac{1}{4}$  to  $\frac{3}{8}$  in. thick is rolled into cylinders. Then, in only one pass, longitudinal butt joints are automatically welded at the rate of 16 ipm. Next, girth butt seams are welded, joining the cylindrical sections.

### Elbows Joined Manually

Since elbows do not fit the turning fixture, they are joined into the line manually, with a flexible welder. Neither automatic nor manual welds need grinding, cleaning, or finishing.

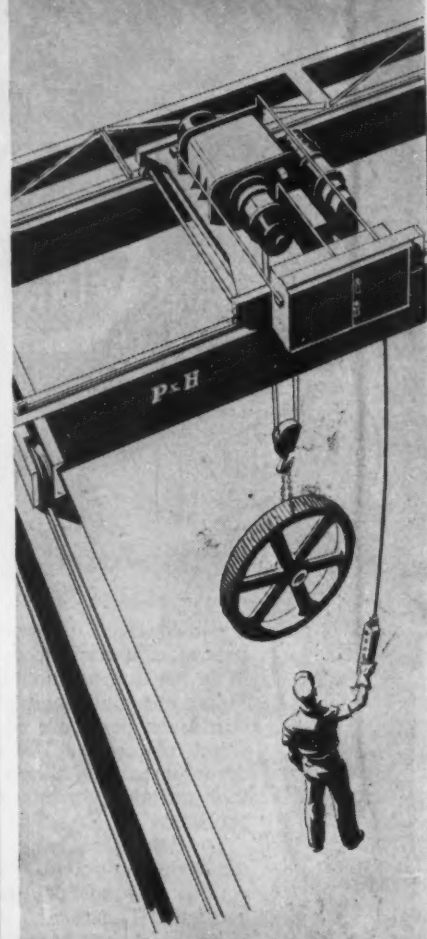


WELDING HEAD of this Unionmelt unit is mounted on an automatic carriage to make a longitudinal butt weld. Speed is 16 ipm. Pipe, shown in shops of Jennings Mfg. Co. of Masbury, Ohio, will carry coke oven gas in steel mills.



CLOSEUP of this large diameter steel pipe shows a clean strong and even weld.  
Turn Page

P&H



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## —Technical Briefs—

### CORROSION:

Resistance of low alloy steels under ground studied by NBS.

Low-alloy steels may be appropriate choices for certain types of underground construction, such as piling, in which mechanical strength, rather than ability to contain a fluid indefinitely without leakage is of prime importance, a recent study by the National Bureau of Standards indicates.

Whether the superior properties of the alloy steel justifies high initial cost must be given careful consideration, the Bureau warns, however.

The extensive use of low-alloy, high-strength steels in many kinds of above-ground construction is based largely on the fact that these steels corrode more slowly than plain carbon steels under most atmospheric conditions.

#### Not Inherently Resistant

Unlike steels containing high percentages of alloying metals, low-alloy steels are not inherently resistant to corrosion. Instead, they owe their corrosion resistance to the development of an adherent layer of corrosion products, which reduces further corrosion to a negligible or at least tolerable rate.

Since these protective deposits develop normally under conditions of good aeration, the usefulness of low-alloy steels as a class for underground construction would seem to depend on their ability to develop and retain protective deposits under the conditions of deficient aeration which are characteristic of corrosive soils.

#### Buried 13 Years

The recent study by the National Bureau of Standards provides new information on the corrosion of certain low-alloy irons and steels in soils. Specimen plates of several of these materials (containing up to 6 pct of alloying elements) together with reference specimens of plain steel, were buried at 15 different test sites for periods up to 13 years.

Included in the study were specimens of copper-molybdenum open-

Turn to Page 187



## Technical Briefs

hearted irons, nickel-copper steels, and chromium steels with and without molybdenum. Sets of specimens were removed at regular intervals over the 13-year period, and after removal of corrosion products the weight losses and depths of the deepest pits were measured.

### Cr-Mo Steels Pit Least

Steels containing 4 to 6 pct of chromium generally lost only about half as much weight as did plain steel under the same conditions. However, the greater corrosion resistance of the alloy steels as measured by weight loss was not generally accompanied by a corresponding reduction in the maximum depth of pits. The least pitting was observed on specimens that contained molybdenum and chromium.

The change in the rate of pitting with time was found to depend on the composition of the steel. Although the initial rate of pitting was greater for the alloy steels the depths of the deepest pits in the alloy steels were usually less than in the plain steel.

### Corrosion Products Slow Action

This fact seems to indicate that after the maximum period of exposure the alloying constituents induce the formation of corrosion products which tend to reduce the rate of pitting with time. In an environment unfavorable to the development of protective deposits of corrosion products, the alloy steels could be expected to develop deeper pits.

### Put Chill on Heat Problem

Lack of known heat transfer factors for the action between monazite sand and acids used in processing the sand to produce thorium nitrate posed a problem for Lindsay Co. in expanding their West Chicago plant. The problem was solved, however, with the cooperation of the Haried Co. of Aurora, Ill. After heat transfer factors were determined, three Worthington Freon-12 compressor units, water chillers and cooling towers were installed.

Turn to Page 191

**MORE of this**

**LESS of this**

*How to Reduce*

**"LOST-BUT-PAID-FOR" HOURS**

Shut down of a machine for tool change does not shut off operating expense. Production stops, but costs run on.

There's a way to minimize this non-productive time . . . Kennametal tools seldom need replacement—hours on the machine, minutes being reground.

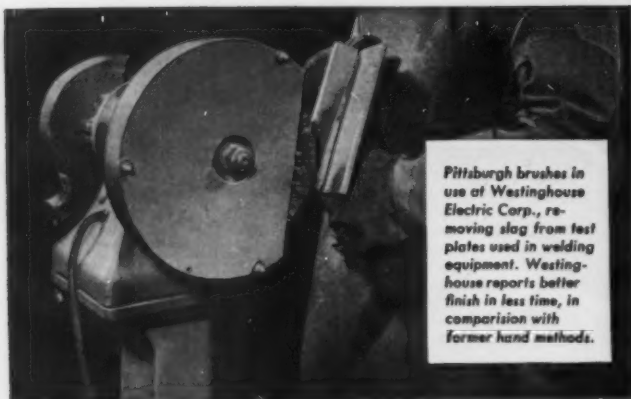
Kennametal is "different"—ingredients, compositions, processing. The resultant distinctive characteristics are utilized to a maximum degree in novel tool designs—especially the clamped-on technique—in which we pioneered.

How Kennametal reduces Lost-but-Paid-for-Hours is disclosed by case studies in periodically-issued Performance Reports, and can be demonstrated in your own plant. Such information and help is yours for the asking. Kennametal Inc., Latrobe, Pa.

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THAT INCREASES PRODUCTIVITY





Pittsburgh brushes in use at Westinghouse Electric Corp., removing slag from test plates used in welding equipment. Westinghouse reports better finish in less time, in comparison with former hand methods.

Replace hand finishing with power-driven Pittsburgh Brushes for

## Better Cleaning Lower Labor Costs Fewer Rejects

—as these companies did:

**Removal of imbedded slag** in welding test plates formerly was done by hand at the Westinghouse Electric Corp., Trafford, Pa., using a wire brush and welder's hammer. Pittsburgh brushes, powered by a direct-drive  $\frac{1}{2}$  h.p. motor, now remove more slag in less time, and produce a better finish. In addition, Westinghouse reports their Pittsburgh brushes "stand up better than average in use."

**Complete cleaning of dried concrete**, rust and scale from steel frames used in concrete forming is essential prior to re-using the forms. Pittsburgh wire brushes were installed at the Universal Form Clamp Co., Chicago. Working on a conveyor-fed machine, the Pittsburgh brushes now remove all foreign material at a rate of 50 pieces per hour, replacing former laborious hand brushing and scraping.

**De-scaling preheated bar stock** at the Dominion Forge & Stamping Co., Ltd., Canada, was formerly done by hand scraping. This never did a complete job, and inclusions resulted which produced defective forgings. Pittsburgh brushes, on specially-designed machines, now do the job, and have "increased efficiency, decreased the amount of scrap, improved work quality, and saved labor."

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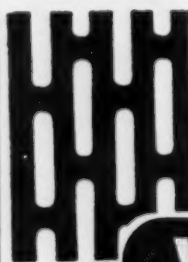
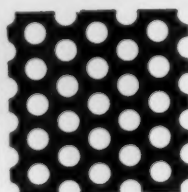
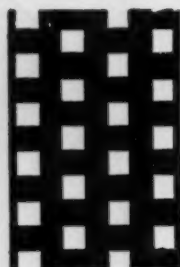
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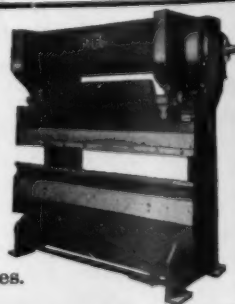
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## —Technical Briefs—

### FLAME HARDENING:

More extensive use of natural gas possible with new equipment.

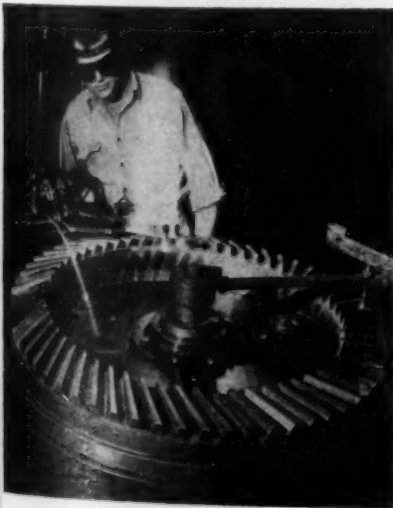
Versatility of specialized flame hardening methods and machines developed by engineers of the Torrance, Calif., plant of the National Supply Co., permit more extensive use of natural gas for this purpose.

A comparatively small number of machines and torches have been adapted to flame harden many different parts. The large variety of parts of various shapes and sizes, and the relatively small quantity of each to process, often make the highly specialized tooling prohibitive in cost.

#### There's Little Distortion

Most parts can be finished machined and heat treated to the desired core properties before flame hardening because there is negligible distortion or decarburization. When dimensions are critical, a small amount of grinding stock can be left on the flame-hardened area.

Natural gas is made practical for surface hardening by mixing oxygen with it in order to attain high enough temperatures to heat the surface of steel parts above the transformation temperature. The heated part is then quenched rapidly to room temperature by



SEMI-AUTOMATIC setup is used for flame hardening of gear for drilling rig rotary at National Supply Co. Heated tooth is moved by an indexer to a water spray for quenching.

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- ✓ check the analysis
- ✓ check the performance

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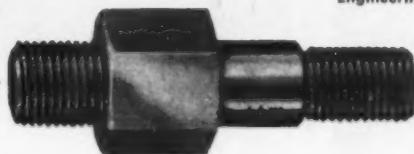
**check the performance**—TUF-STUF alloys are light and strong—about 8% lighter than cast bronze and almost as strong as steel. They have a low coefficient of friction as well as good bearing and mechanical properties. They not only retain these properties but resist oxidation at the high speeds and high temperatures of modern production equipment. They will withstand strong acid attack or the effects of brackish waters and are highly resistant to corrosion.

These alloys can be hot-forged into relatively intricate shapes... need little or no machining... and the smooth, bright surfaces eliminate costly finishing.

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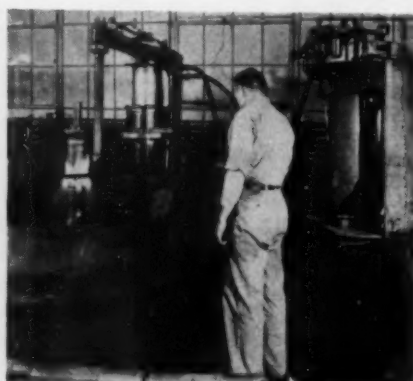
### —Technical Briefs—

water or oil. Extremely shallow depths can be hardened by a short intense heat and depths of  $\frac{1}{8}$  in. or more can be hardened by heating more slowly.

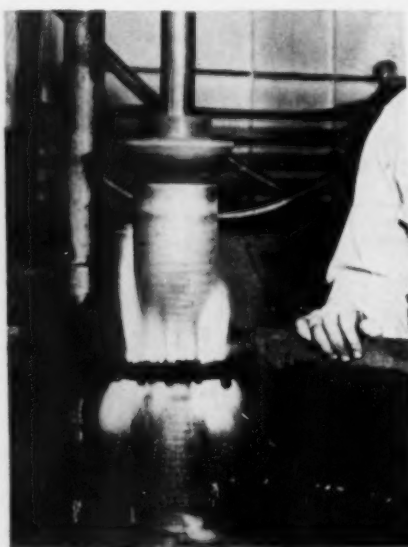
#### Set Close Control

Quality work is produced by close control of temperature, which is a critical factor. Although temperature is not measured directly, other factors such as the type and design of the torch, pressures of natural gas and oxygen, space permitted between burner tip and part, and the time interval of heat application, are varied to obtain the necessary close control of temperature.

Spot hardening is the simplest



COMBINATION gas ring torch and water spray moves upward over a rotating wash pipe to give a continuous hard surface of uniform depth. Controls, regulators and measuring devices are on operator's right.



CLOSEUP of the gas ring torch and water spray as it moves up the rotating wash pipe.

Turn to Page 194

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### Insulated Thermocouple Wire Extension Lead Wire

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No matter what your wire or insulation requirements may be, you can depend on Gordon "Serv-Rite" insulated wire for pyrometers—recognized as a standard of highest quality for nearly half a century. All "Serv-Rite" wire is now manufactured in the new, completely modern Gordon plant, employing up-to-date equipment and machinery, supervised and operated by skilled technicians—your guarantee of continued precision quality. In addition to maintaining large stocks of all common types of wire, Gordon will manufacture special insulation, in long or short runs, to suit your individual needs and meet your most rigid specifications.

#### All Types of Insulation

Felted Asbestos  
Asbestos Braid  
Weatherproof Braid  
Glass Braid  
Polyvinyl Plastic  
Nylon Braid  
Stainless Steel Armored Braid  
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Manufacturers & Distributors

Thermocouple Supplies • Industrial Furnaces & Ovens  
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# For Big Business-SURE ...and Small Business, too!

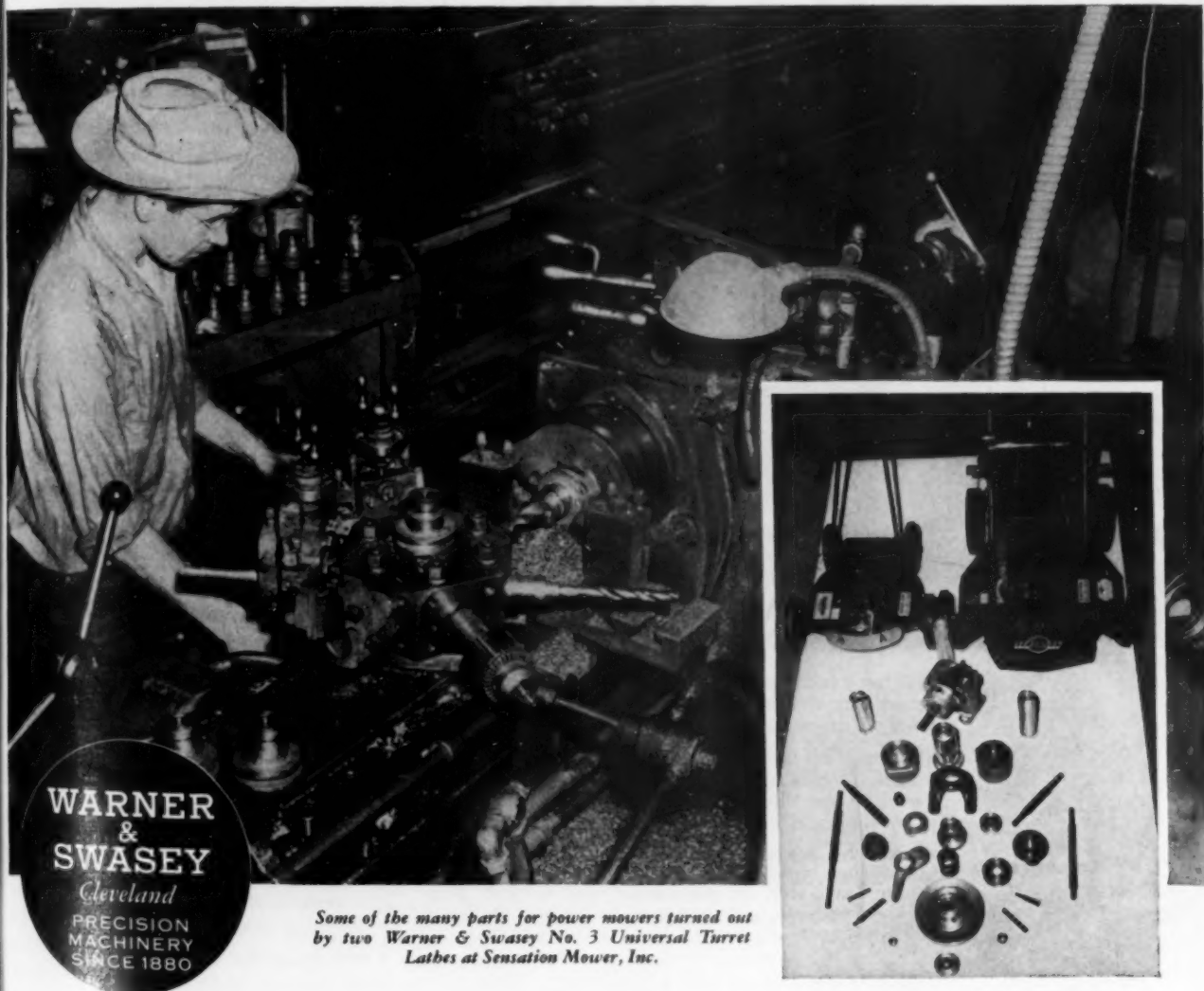
SENSATION MOWER, INC., Ralston, Neb., is not a high production shop in terms of metalworking plants. But this relatively young company, using only two Warner & Swasey No. 3 Universal Turret Lathes for their entire metal turning needs, was able to compete effectively and grow in the power lawn mower field.

The two Warner & Swaseys give Sensation Mower the versatility they need to produce over 40 different parts for mowers. They also turn out parts for newer lines of snow removal equipment

and power floor polishers. The Warner & Swaseys' versatility has even enabled the company to take on sub-contract work during their "off-season".

Both machines have had a total of *only one day's downtime* since their installation in 1946!

You can count on this kind of highly versatile, dependable production with Warner & Swasey Turret Lathes—money-makers whether you're a small manufacturer or in business in a "big" way!



**WARNER  
&  
SWASEY**  
Cleveland  
PRECISION  
MACHINERY  
SINCE 1880

Some of the many parts for power mowers turned out by two Warner & Swasey No. 3 Universal Turret Lathes at Sensation Mower, Inc.

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

September 17, 1953

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job for a torch. This requires heating only the area to be hardened, using a hand torch, and following with direct quenching in an oil or water bath. Only areas not dimensionally critical can be treated in this way, since no controlling mechanism can be used and the operator depends on visual estimation of both temperature and depth of heat.

Parts commonly flame hardened in this way include sprockets for drive groups and draw works. These parts have relatively large

teeth, move in only one direction, and therefore need to be hardened on one face of the teeth only.

#### Watch Rotation Speed

Stationary ring torches consisting of two or more gas burners are used in hardening other parts while they are rotated at a predetermined speed. After reaching the desired temperature parts are submerged in a quenching bath.

A third method of flame hardening is by progressively moving the torch over the area to be hard-

ened and following with a water spray quench. Many of the torches are made with a separate manifold for the water spray so that, as a segment of a surface to be hardened is heated to the desired temperature, the torch moves along the work and the spray contacts the heated area immediately afterward.

Large ring gears and pinions, which drive the rotary table of the drilling rig, and many smaller gears are hardened by this method. Large sheaves for crown and traveling blocks are hardened similarly although the sheaves are rotated slowly and the gas torch remains stationary.

#### Continuous Hard Surface

A ring torch with a water spray attachment is used on some cylindrical parts while the part is rotated and the torch is moved from the bottom to the top of the surface being hardened. This method gives a continuous hard surface of uniform depth on either outside or inside diameters.

The main objective in flame hardening is the same as in other methods of surface hardening: to produce a thin, hard layer of metal that will resist wear by abrasion over a softer, more shock resisting core. Since hardness obtainable in steel is determined primarily by the carbon content of the steel, the grades to be hardened are selected carefully.

#### Steels Usually Handled

The most common types are carbon and low alloy steels which contain 0.30 to 0.50 pct C. The hardest surfaces (Rockwell "C" or better) are obtained in steels containing as much as 1.00 pct C. Extreme care is then taken to avoid cracking during processing.

Although hardness can be checked by several methods, the Scleroscope is most commonly used because it does not damage the surface by a deep impression and the instrument does not have to be supported by a vise to apply the load. Rockwell instruments and special testing files are also used.

**To SHELDON CHICAGO Lathe Owners U.S.A.**

**For All Sheldon Lathes less than 5 Years old...we have just published a new Parts List Manual, with:**

**SHeldon Lathe Parts List**

**Note: Serial numbers are found between the frontways, at right end of bed.**

... every lathe part and sub-assembly illustrated, named, numbered and positioned on explanatory exploded drawings.

... a section which illustrates and describes each of over 50 modern Attachments and Accessories to make your Sheldon Lathe even more versatile, productive and valuable to you.

To get this valuable Parts List (and Accessory) Manual just write (1) the serial number of your Sheldon Lathe and (2) your name, and (3) your firm name and address, on a post card, letterhead, billhead or slip of paper and mail it to "Parts Manual".

**SHELDON MACHINE CO., INC.**  
4224 North Knox Ave., Chicago 41, Illinois



# THE IRON AGE SUMMARY...

- Competition forces producers to cut premium prices
- Start of freight absorption shows need for new law
- Ingot rate gains one point; scrap still falling

Steel consumers are beginning to reap their first dividends from a buyers' market, as some firms have cut prices on certain products. So far only premium prices are affected. But prices could be slashed below regular mill levels if competition for orders continues to grow more keen.

Price cuts have aroused keen interest but no panic in the trade. They were expected.

Pure economics are beginning to dictate more nearly competitive prices by premium producers. They are faced with the alternative of slashing prices or operating at a lower rate.

An eastern producer cut hot-rolled sheets and strip \$5.50 a ton, leaving its prices still slightly higher than most mills charge. A Detroit producer shaved alloy products including billets, blooms and slabs, hot-rolled and cold-drawn bars \$1 a ton. This producers' prices, while lower than Detroit competitors, are still higher than prices of large producers in other areas. A producer of carbon bars is meeting competition in Chicago with a price lower than it charges at its mill. Also in Chicago a producer of manufacturers' bright wire cut prices \$2 a ton, making it competitive with other producers.

The trend is already evident: premium prices are on the way out. From now on steel producers will watch the competition like a hawk in an effort to detect any price cuts before available business has been booked. And older heads will remember price wars of the thirties, hoping they are not to be repeated.

But concessions or inducements to consumers do not always take the form of lower base prices. Lower costs to consumers may also result from reductions in extra charges or freight absorption.

Competition has already induced independent mills to begin first, cautious absorption of freight. But most mills have remained gunshy of anything but f.o.b. prices ever since July 1948 when the Supreme Court decision in the cement case outlawed basing point pricing.

Steel firms now absorbing freight on merchant wire products, stainless items and mechanical tubing are going to great length to assure legality of their action. Usual procedure is for the district office of a producer to certify that to remain competitive in a given area a certain price must be met. Producer then decides whether to compete or withdraw.

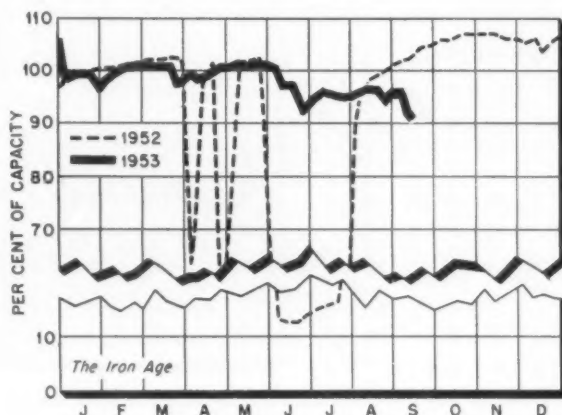
Federal Trade Commission says it's OK to meet competition in this way. But steel firms shouldering freight bills are watching FTC over their shoulders. They'd feel a lot better if Congress would pass one of the proposed bills spelling out legality of freight absorption.

There is no panic in the steel industry despite the fact that the ingot rate last week dipped to the lowest point (89.5 pct) in 13 months. Steel officials knew it was coming, had predicted it. Also last week's lower rate resulted partly from Labor Day holiday and a strike that flattened operations of one of the nation's largest steel plants at Lackawanna, N. Y.

## Steel Operating Rates

	Week of Sept. 13	Week of Sept. 6		Week of Sept. 13	Week of Sept. 6
Pittsburgh	93.0	94.0*	Detroit	99.0	99.0*
Chicago	100.5	99.5	Birmingham	96.5	99.5
Philadelphia	97.0	96.5	Wheeling	100.0	101.0*
Valley	97.0	97.0*	S. Ohio River	82.0	85.0
West	102.0	92.5*	St. Louis	95.0	94.0
Cleveland	96.0	95.0*	East	79.0	76.0*
Buffalo	25.5	71.5*	AGGREGATE	90.5	87.5*

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.  
\* Revised.



WHAT'S YOUR GUESS ON THIS

## Machinability Comparison?



**ENDURO STAINLESS STEEL  
BARS ARE —% AS  
MACHINABLE AS  
BESSEMER SCREW STOCK**

*Would You Say*

(a) 42% (b) 67% (c) 100%  
(d) 33% (e) 90%

?

**Y**OU CAN APPLY the high physical and chemical properties of ENDURO Stainless Steel to duplicate parts you're running now—and still get fast automatic production.

Free-Machining ENDURO Bars are cold-finished by Republic's Union Drawn Steel Division especially for that purpose. They provide close tolerances, accuracy of section, uniform soundness, and fine surface finish.

*Two grades are fully 90% as machinable as Bessemer screw stock. If 90% was your answer to the question above, you've probably had ex-*

perience with Free-Machining ENDURO Bars. If you haven't, Republic metallurgists will be glad to give you prompt assistance on applications, processing, and use. Free-Machining ENDURO also is available in hot-rolled bars and in wire. Get more details from your nearest Republic District Sales Office, or write:

**REPUBLIC STEEL CORPORATION**

*Alloy Steel Division • Massillon, Ohio*

GENERAL OFFICES

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Export Department: Chrysler Building, New York 17, N.Y.

*Republic* **ENDURO**  
**FREE-MACHINING**



**STAINLESS STEEL**

Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

# Markets at a Glance

**Alcoa Expands**—Aluminum Co. of America has started work on a \$3.68 million modernization and expansion of ingot making facilities in Cleveland. Program will supplement the \$40 million Air Force heavy press plant also under construction. Firm plans to add four new gas-fired and two electric furnaces, which will increase forging and ingot capacity by 370 pct. Alcoa is also constructing the multi-million dollar press plant for the Air Force and expects to operate 30,000 and 50,000 ton presses for the military when the Cleveland press plant is completed.

**Secondary Aluminum Dips** . . . Eastern market for foundry grades of secondary aluminum ingot dipped up to 1¢ per lb while steel deoxidizing grades were off from ½¢ to 2¢. Midwestern ingot makers, however, report their market has shown a slight increase in demand with prices continuing at earlier levels.

**Cut Galvanized Pipe Prices** . . . Because of the ½¢ per lb drop in zinc prices on Sept. 2 U. S. Steel Export Co. has trimmed prices of its galvanized pipe. Decrease on galvanized butt weld and seamless pipe is \$1 per net ton except for 2-in. galvanized which is \$1.50 a ton lower. Domestic prices also declined a similar amount. Another ½¢ drop in zinc on Sept. 11 means that galvanized products will be trimmed again.

**Ford Blooming Mill Out** . . . As part of the modernization of steelmaking facilities at Ford Motor Co.'s River Rouge steel mill, the blooming mill has been shut down for about 15 days while mechanical improvements are being made. As a result of this shutdown, two openhearth and five electric furnaces have been taken out of operation for the same period. During this time, cranes used to strip ingots will be moved to a new stripping building. One of Ford's four blast furnaces was also taken out for about 45 days for relining.

**Expand Chevrolet Plant** . . . General Motors Corp. plans to start expanding its Cleveland Chevrolet plant this fall. When the multi-million dollar project is completed next year the Brook Park plant will boast an additional 160,000 sq ft of floor space for manufacture of pressed metal parts, subassemblies, and Powerglide transmissions.

**Lower Alloy Prices** . . . Rotary Electric Steel Co., Detroit, reduced prices on three alloy steel products. New prices are: Billets, \$84 per net ton; alloy hot-rolled bars, 4.975¢ per lb; alloy cold-drawn bars, 6.425¢ per lb.

**Bethlehem Plant Idle** . . . Strike by 1000 coke oven workers last week forced complete shutdown of Bethlehem's Lackawanna plant. The plant employs 17,800 workers. Forced out of production were 32 openhearth and 7 blast furnaces. Cause of the strike was a dispute involving new working schedules. Joseph P. Molony, United Steel Workers' state director, termed the walkout a wildcat strike and ordered the men back. The strike was still in effect at presstime, however.

**Cancel Orders** . . . Midwest steel firms continue to report cancellations on small tonnages. Customers have been hinting freight-absorption to Eastern mill reps but with little results. One firm, however, did absorb some freight. Cancellations have been reported in sheet, bar and silicon sheet.

**Double Ferromanganese Output** . . . Ferromanganese production at U. S. Steel's Duquesne Works has been doubled by the conversion of No. 1 blast furnace from iron to ferro last week. The furnace conversion follows establishment of a ferromanganese gas cleaning plant at the Duquesne Works and makes this plant U. S. Steel's principal ferromanganese producer.

## Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Last Week	Month Ago	Year Ago
<b>Composite Prices</b>				
Finished Steel,				
base .....	4.634	4.634	4.634	4.376
Pig Iron (gross ton) ..	\$56.76	\$56.76	\$56.76	\$55.26
Scrap, No. 1 hvy.				
(gross ton) .....	\$37.17	\$38.67	\$43.17	\$42.00
<b>Nonferrous Metals</b>				
Aluminum, ingot ....	21.50	21.50	21.50	20.00
Copper, electrolytic ..	29.50	29.50	29.25	24.50
Lead, St. Louis .....	13.80	13.80	13.80	15.80
Magnesium, ingot ...	27.00	27.00	27.00	24.50
Nickel, electrolytic ..	63.08	63.08	63.08	59.58
Tin, Straits, N. Y. ..	82.00	83.00	83.00	\$1.21%
Zinc, E. St. Louis ....	10.00	10.50	11.00	14.50



## Alimport Intervenes in Alcoa Suit

**Firm has Kitimat financing at stake . . . Declares contract legal . . . Hope for early trial . . . Zinc drops another 1/2¢ per lb following London decline—By R. L. Hatschek.**

Aluminum Import Corp., the U. S. sales agent for Aluminum Co. of Canada, has been permitted to intervene in the Dept. of Justice suit against Aluminum Co. of America. It was expected that Alimport would intervene—it actually has more at stake than others in the case. After all, a flying start for Alcan's Kitimat reduction plant depends largely on obtaining long-term contracts on which to base financing.

Alimport declares that its contract with Alcoa, which Justice Dept. is trying to cancel, is not illegal under the antitrust law or the judgment in the Alcoa case. Alcoa agrees.

**Above Needs . . .** The firm also states that the total tonnage covered by the Alcoa and the Kaiser Aluminum & Chemical Corp. agreements—786,500 tons in all—will not force any trimming of shipments to non-integrated fabricators.

The Canadian producer is reserving 110,000 tons of metal a year for the next 7 years for this branch of industry. This reserve, Alimport says, is greater than it has ever sold to non-integrated fabricators and exceeds the firm's estimate of normal demand for Canadian pig and ingot.

**Hope For Speed . . .** Other vitally interested parties are Olin Industries, Inc., and the Wheland Co. Both would like to become primary aluminum producers but neither can swing the finances without government aid. Washington is currently sitting on the third round expansion and no decision is expected until it is determined if the expanded Canadian imports will go through.

Alcoa wants to get to work on the metal and Alcan wants to know where it stands. But the case hasn't hit the court yet. Hopes are high that it will fit into the calendar early this fall—but it may not come before a judge until November or so. Meanwhile, everybody fidgets.

**Copper Slowdown . . .** Kennecott Copper Co.'s \$50 million, 16,000-ton-per-month refinery at Garfield, Utah, last week was ready for a full shutdown. Reduced to 10 pct of normal output by what the company terms a "vicious slowdown," only 83 maintenance men of the regular 600 work crew were to be kept on the job past Sept. 13.

The forced layoff makes workers eligible for unemployment compensation. Coupled with a softening copper demand, a long walkout seems probable, unlike last year's

strike which was settled in a few days.

**Mining Continues . . .** Mine output continues uninterrupted, two-thirds going to the neighboring American Smelting & Refining Co. smelter and the remainder to Baltimore, currently farming out smelting and refining among eastern plants.

Although the slowdown started Aug. 24, negotiations for a 16 1/2¢ per hour increase started only last week when federal conciliators were called in. Major hurdle is a 4.2¢ differential previously existing in favor of the United Steelworkers over the International Union of Mine, Mill & Smelter Workers. USW wants the differential continued.

**Zinc Price Drops . . .** Following a decline in zinc on the London Metals Exchange to the equivalent of about 10.00¢ per lb at New York the U. S. price was dropped to 10.00¢ f.o.b. East St. Louis. The practice of absorbing freight over 1/2¢ per lb is being continued, making the delivered New York price 10.50¢ per lb. Immediate effects were felt in lead. Though this price held at 13.80¢ per lb f.o.b. St. Louis, the tone of the market turned softer.

Statistics of the American Zinc Institute show smelter stocks at the beginning of the month totaled 117,897 tons, about 14,000 tons above the previous month. High level smelter operations in August (83,241 tons produced) and lower shipments (69,250 tons) were the cause.

**No Nickel Decontrol . . .** "There will be no decontrol (of nickel) until Office of Defense Mobilization is assured that all defense programs can be completely met," a mobilization official told THE IRON AGE. He added there is no point in decontrolling nickel if a recontrol order is necessary a short time later.

### NONFERROUS METAL PRICES

(Cents per lb except as noted)

	Sept. 9	Sept. 10	Sept. 11	Sept. 12	Sept. 14	Sept. 15
Copper, electro, Conn. . . . .	29.00—	29.00—	29.00—	29.00—	29.00—	29.00—
	30.00	30.00	30.00	30.00	30.00	30.00
Copper, Lake delivered . . . . .	30.125	30.125	30.125	30.125	30.125	30.125
Tin, Straits, New York . . . . .	83.00	82.00	82.00	82.00	82.00	82.00*
Zinc, East St. Louis . . . . .	10.50	10.50	10.00	10.00	10.00	10.00
Lead, St. Louis . . . . .	13.80	13.80	13.80	13.80	13.80	13.80

Note: Quotations are going prices

\*Tentative

**BETTER STAINLESS  
CLOSER CONTROL  
LOWER LABOR COSTS**  
*with ALLOYMET 2115*

**I**N THE production of stainless steels, the trend is toward closer controls of analysis through the use of quality master alloy ingot. Our ALLOYMET 2115 ingot (70% Nickel—10% Chrome) is fast becoming the standard of the industry as a basic raw material in the production of stainless steels.

When ALLOYMET 2115 is used in the melt, the analysis of the finished product is never in doubt. Compare this with a heat of 18-8 scrap . . . but no, there is no comparison. Scrap—no matter how good it may be—is still an imperfect commodity that is generated; not made to order. ALLOYMET 2115, on the other hand, is a master alloy made to rigid specifications under the supervision of trained metallurgists who know the needs of the steel industry.

Steel producers are rapidly learning that to use master alloys in the place of scrap costs so very little more. Prove this by your own use.

**ALTER**

*Alloy Metal Division*

COMPANY

1701 Rockingham Road, DAVENPORT, IOWA

Phone 6-2561

Teletype DV 588

September 17, 1953

201

# Nonferrous Prices

(Effective Sept. 15, 1953)

## MILL PRODUCTS

(Cents per lb, unless otherwise noted)

### Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.136-in. and thicker, 2S, 3S, 37.9¢; 4S, 36.0¢; 52S, 38.2¢; 24S-O, 24S-OAL, 37.0¢; 76S-O, 76S-OAL, 44.7¢. 0.081-in., 2S, 3S, 35.1¢; 4S, 37.7¢; 52S, 39.9¢; 24S-O, 24S-OAL, 38.4¢; 76S-O, 76S-OAL, 46.9¢. 0.082-in. 2S, 3S, 37.0¢; 4S, 41.8¢; 24S-O, 24S-OAL, 46.9¢; 76S-O, 76S-OAL, 58.4¢.

Plate, 1/4-in. and heavier: 2S-F, 3S-F, 32.4¢; 4S-F, 34.5¢; 52S-F, 36.2¢; 61S-O, 35.6¢; 24S-O, 24S-OAL, 36.9¢; 76S-O, 76S-OAL, 44.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 37.4¢ to 82.8¢; 12 to 14, 38.2¢ to 99.0¢; 24 to 26, 40.9¢ to 112.9; 36 to 38, 48.4¢ to 118.9¢.

Rod, Rolled: 1.064 to 4.5-in., 2S-F, 3S-F, 43.8¢ to 37.2¢; cold-finished, 0.375 to 3.499-in., 2S-F, 3S-F, 47.6¢ to 39.3¢.

Screw Machine Stock: Rounds, 11S-T3, 1/4 to 1 1/32-in., 69.6¢ to 47.0¢; 1/2 to 1 1/2-in., 46.6¢ to 43.8¢; 1 1/2 to 3-in., 42.7¢ to 39.9¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 44.1¢ to 32.4¢; 52S, 53.4¢ to 39.1¢; 17S-T4, 60.1¢ to 41.8¢; 61S-T4, 53.9¢ to 41.3¢.

Extruded Tubing: Rounds, 63S-T5, OD 1 1/4 to 2-in., 41.6¢ to 60.7¢; 2 to 4 in., 37.7¢ to 51.1¢; 4 to 6 in., 38.2¢ to 46.6¢; 6 to 9 in., 38.7¢ to 48.8¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42 1/2 x 60 in., \$2.838; x 96 in., \$4.543; x 120 in., \$5.680; x 144 in., \$6.816. Coiled sheet, per lb, 0.019 in. x 28 in.

### Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: F81-O, 1/4 in., 66¢; 3/16 in., 68¢; 1/2 in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specifications grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam 1/4 to 0.311 in., 77¢; 1/2 to 1/4 in., 60.6¢; 1 1/4 to 1.749 in., 56¢; 2 1/2 to 5 in., 51.5¢. Other alloys higher. Base up to 1/4 in. diam, 10,000 lb; 1/2 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 26 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/4 lb, 10,000 lb; 1/2 to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.067 in. wall thickness: OD, 1/4 to 5/16 in., \$1.43; 5/16 to 1/2 in., \$1.29; 1/2 to 3/4 in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall: OD, 1/4 to 1/2 in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1 1/2 in., 10,000 lb; 1 1/2 to 3 in., 20,000 lb; over 3 in., 30,000 lb.

### Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$6; Forgings, \$6.

### Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

"A" Nickel Monel			Inconel
Sheet, CR	86 1/2	67 1/2	92 1/2
Strip, CR	92 1/2	70 1/2	98 1/2
Rod, bar	82 1/2	65 1/2	88 1/2
Angles, HR	82 1/2	65 1/2	88 1/2
Plate, HR	84 1/2	66 1/2	90 1/2
Seamless Tube	115 1/2	100 1/2	137 1/2
Shot, blocks		60	

### Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	46.41		48.48
Copper, h-r	48.38	44.73	
Copper, drawn		45.98	
Low brass	44.47	44.41	
Yellow brass	41.72	41.66	
Red brass	45.44	45.38	
Naval brass	45.76	40.07	41.33
Leaded brass			39.11
Com. bronze	46.95	46.89	
Mang. bronze	49.48	43.62	45.18
Phos. bronze	66.58	67.08	
Muntz metal	43.96	39.77	41.02
Ni silver, 10 pct	55.36		62.63

## PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	21.50
Aluminum pig	20.00
Antimony, American, Laredo, Tex.	34.50
Beryllium copper, per lb conta'd Be.	\$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	\$72.75
Bismuth, ton lots	\$2.25
Cadmium, del'd	\$2.00
Cobalt, 97-99% (per lb)	\$2.40 to \$2.47
Copper, electro, Conn. Valley	29.00 to 30.00
Copper, Lake, delivered	30.125
Gold, U. S. Treas. dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$165 to \$175
Lead, St. Louis	13.80
Lead, New York	14.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	27.00
Magnesium, sticks, 100 to 500 lb.	45.00 to 47.00
Mercury, dollars per 76-lb. flask, f.o.b. New York	\$186 to \$189
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$93.00
Silver, New York, cents per oz.	85.25
Tin, New York	82.00
Titanium, sponge	\$5.00
Zinc, East St. Louis	10.00
Zinc, New York	10.50
Zirconium copper, 50 pct	\$6.20

## REMELTED METALS

### Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	24.50
No. 120	23.75
No. 123	23.25
80-10-10 ingot	
No. 305	28.75
No. 315	26.50
88-10-2 ingot	
No. 210	37.50
No. 215	34.00
No. 245	29.50
Yellow ingot	
No. 405	20.75
Manganese bronze	
No. 421	25.25

### Aluminum Ingot

(Cents per lb del'd, 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	23.75-24.50
0.60 copper, max.	23.25-24.25
Piston alloys (No. 122 type)	22.00-22.50
No. 12 alloy (No. 2 grade)	21.50-22.00
108 alloy	22.00-22.50
195 alloy	22.50-24.00
13 alloy (0.60 copper max.)	23.00-23.50
ASX-679	21.75-22.50

### Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97 1/2%	21.75-23.50
Grade 2—92-95%	20.75
Grade 3—90-92%	19.75
Grade 4—85-90%	18.50-20.00

## ELECTROPLATING SUPPLIES

### Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	44.54
Electrodeposited	38.38
Flat rolled	47.14
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	85.00
Rolled, depolarized	86.00
Cadmium	\$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz., f.o.b. Bridgeport, Conn.	94 1/2

### Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63.90
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz. lots, per oz.	75 1/2
Sodium cyanide, 96 pct domestic	
230 lb drums	19.25
Zinc cyanide, 100 lb drum	54.30

## SCRAP METALS

### Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	26	28 1/2
Yellow brass	19 1/2	18 1/2
Red brass	23	23 1/2
Comm. bronze	23 1/2	23 1/2
Mang. bronze	18 1/2	17 1/2
Yellow brass rod ends	19 1/2	

### Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	23 1/2	23 1/2
No. 2 copper wire	21 1/2	21 1/2
Light copper	20	20 1/2
*Refinery brass		19
*Dry copper content.		

### Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	23	23 1/2
No. 2 copper wire	21 1/2	21 1/2
Light copper	20	20 1/2
No. 1 composition	17	17 1/2
No. 1 comp. turnings	16 1/2	17 1/2
Rolled brass	14	14 1/2
Brass pipe	15	16
Radiators	13	13 1/2
Aluminum		
Mixed old cast	12	12 1/2
Mixed new clips	13 1/2	14 1/2
Mixed turnings, dry	13	13 1/2
Pots and pans	12	12 1/2

### Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

### Copper and Brass

No. 1 heavy copper and wire	21	22
No. 2 heavy copper and wire	19	20
Light copper	16 1/2	17 1/2
New type shell cuttings	16 1/2	17 1/2
Auto radiators (unswaged)	11	11 1/2
No. 1 composition	15	16
No. 1 composition turnings	14 1/2	15 1/2
Unlined red car boxes	13	13 1/2
Cocks and faucets	13	13 1/2
Mixed heavy yellow brass	10	10 1/2
Old rolled brass	13	13 1/2
Brass pipe	14 1/2	15
New soft brass clippings	16	16 1/2
Brass rod ends	15	15 1/2
No. 1 brass rod turnings	14	14 1/2

### Aluminum

Alum. pistons and struts	6 1/2
Aluminum crankcases	9
2S aluminum clippings	13
Old sheet and utensils	6 1/2
Borings and turnings	9
Misc. cast aluminum	10
Dural clips (24S)	10

### Zinc

New zinc clippings	5 1/2	6 1/2
Old zinc	4	4 1/2
Zinc routings	3 1/2	3
Old die cast scrap		3 1/2

### Nickel and Monel

Pure nickel clippings	70	80
Clean nickel turnings	40	50
Nickel anodes	70	80
Nickel rod ends	70	80
New Monel clippings	28	30
Clean Monel turnings	19	21
Old sheet Monel	25	27
Nickel silver clippings, mixed		14
Nickel silver turnings, mixed		12

### Lead

Soft scrap, lead	10 1/2	11
Battery plates (dry)	6	6 1/2
Batteries, acid free	3 1/2	4

### Magnesium

Segregated solids	20	21
Castings	19	20

### Miscellaneous

Block tin	63	65
No. 1 pewter	42	45
No. 1 auto babbitt	37	40
Mixed common babbitt	11 1/2	12 1/2
Solder joints	15	16 1/2
Siphon tops	14 1/2	15 1/2
Small foundry type	13 1/2	14 1/2
Monotype	12 1/2	13 1/2
Lino. and stereotype	11	11 1/2
Electrotype	8	8
Hand picked type shells	5 1/2	5 1/2
Lino. and stereo. dross	8 1/2	9 1/2
Electro dross		4 1/2





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## Prices Slide in Listless Market

**No improvement in market . . . Prices decline further in most centers . . . Ingot rate dip quickens fears . . . Iron Age Steel Scrap Composite at lowest point in years.**

Scrap, sick man of the steel industry, showed no improvement in the past week. The patient was almost comatose, with pulse weak and breathing very shallow. Industry medicine men warned that convalescence might be further delayed, stood by waiting for the crisis to pass.

Worsening symptoms included a further decline in prices in most areas, low movement and worse demand. Steel mills continued to take advantage of large inventories and expanded hot metal capacity. A further complication was the depressed ingot rate. Foundry business generally continued about the same—terrible.

THE IRON AGE Steel Scrap Composite declined again, this time \$1.50 to \$37.17. This is the lowest reading for the composite since July 25, 1950. And many trade sources expect to see it still lower in the next few weeks.

Price dips in steelmaking grades were around the \$2 level in several areas. But low movement complicated firm pricing, made many prices nominal. In some areas dealers were reported as refusing to buy industrial scrap.

In Cleveland metallics were being shipped into the Valley by some dealers. In Milwaukee, price cuts of \$3 to \$5 in the next few weeks were being despondently forecast. Hope for new mill orders in October was still flickering, but in most districts was dim.

Pittsburgh—Continued lack of buying forced further price reductions this week. On appraisal, No. 1 heavy melting steel is off \$1 per ton. Most other prices held steady momentarily, but the price structure is shaky. Despite the inert market, scrap men are anything but pessimistic. They say that regardless of apparent weakness,

there is nothing wrong with the market that a tonnage purchase wouldn't cure. Outlook for the near future is cloudy.

Chicago—Prices were largely nominal last week in an almost complete absence of buying. Little relief was expected in the near future. Volume of inter-broker trading had stepped up slightly, but consumer sales in nearly all grades were almost at a standstill. Hope for a pickup in October was fading and general consensus was that the market was going to continue its slip. Milwaukee appeared even worse, with drops of \$3 to \$5 forecast for the next 2 or 3 weeks.

Philadelphia — Steelmaking scrap prices continued their nosedive this week with No. 1 grades off \$2 and No. 2 grades down from \$1 to \$1.50. Sales are shrinking and truck deliveries are becoming more significant by default. Trading is practically dead in low phos, better grade turnings, and several cast grades. New business confirmed the earlier quotation for cupola cast.

New York—Scrap movement is virtually at a standstill here. The trade is generally pessimistic, seeing little chance for fresh orders of any consequence for some time. Many believe things will get worse before they get better, fear further softening of steel operating rates. In the absence of business prices are largely nominal but generally \$1 under last week's quotations.

Detroit—No. 1 bundles dropped another \$2 on the basis of a reported sale, bringing No. 1 heavy melting steel and low phos down a notch also. No. 2 heavy melting slipped to the same level as secondary bundles in what some of the trade believes may be a permanent tying of prices of these two grades. There are practically no sales here and much of this month's industrial scrap appears to

be without a home. Consumers will not mention a price at any level.

Cleveland—Open-hearth grades in Cleveland came down. There is absolutely no local buying and dealers are forced to lay down scrap or ship to the Valley. At press time there was no relief in sight as one large consumer continued to hold up shipments. Those who believe the drop has been too precipitous expect to see prices bounce back in October.

Birmingham—With most northern mills out of the market and only one southern steel mill buying limited quantities, scrap continues dull. There was some movement of foundry grades. Prices were unchanged.

St. Louis — Heavy inventories and expectation of still lower prices have virtually halted mill buying, driving some prices further down. Orders placed in August expired this week, and there is no indication of when the mills will re-enter the market. Movement has been low.

Cincinnati—Two major consumers are both out of the market and new orders are next to impossible to find in this area. Weak foundry demand has forced blast furnace grades down \$1. Slump in rails was even more pronounced as random lengths and 18-in. crops dropped \$3 to \$42 and \$51 respectively. Many believe this market would stabilize if local consumers came in for spot tonnages.

Boston—To say that the bottom has fallen out of the market is an understatement. Brokers and dealers agreed early this week it was one of the worst markets they've ever seen. Steelmaking and blast furnace grades were quoted \$1 to \$2 under last week, but almost total lack of business made all prices nominal. A further decline is expected by many.

West Coast—Market continued very sluggish with prices unchanged. Some shipments from California to the slightly more active Seattle area market were rumored but tonnage involved would be very small. Freight from San Francisco area would be over \$11 and price differential about \$6 maximum.

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Iron and Steel Scrap...*

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SEATTLE, WASH.

**LEADERS IN IRON AND STEEL SCRAP SINCE 1889**



# Scrap Prices

(Effective Sept. 15, 1953)

## Pittsburgh

No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	34.00 to 35.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and ma. turns.	24.00 to 25.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	28.00 to 29.00
Low phos. punch'gs, plate	44.00 to 45.00
Heavy turnings	36.00 to 37.00
No. 1 RR. hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	52.00 to 53.00
RR. steel wheels	45.00 to 47.00
RR. spring steel	45.00 to 47.00
RR. couplers and knuckles	45.00 to 47.00
No. 1 machinery cast.	47.00 to 48.00
Cupola cast	39.00 to 40.00
Heavy breakable cast	37.00 to 38.00
Malleable	45.00 to 46.00

## Chicago

No. 1 hvy. melting	\$34.00 to \$36.00
No. 2 hvy. melting	29.00 to 31.00
No. 1 factory bundles	37.00 to 38.00
No. 1 dealers' bundles	33.00 to 35.00
No. 2 dealers' bundles	26.00 to 27.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	17.00 to 19.00
Shoveling turnings	17.00 to 19.00
Cast iron borings	17.00 to 19.00
Low phos. forge crops	42.00 to 43.00
Low phos. punch'gs, plate	37.00 to 38.00
Low phos. 3 ft and under	36.00 to 37.00
No. 1 RR. hvy. melting	35.00 to 37.00
Scrap rails, random lgth.	41.00 to 43.00
Rerolling rails	49.00 to 52.00
Rails 2 ft and under	49.00 to 50.00
Locomotive tires, cut	41.00 to 42.00
Cut bolsters & slide frames	40.00 to 42.00
Angles and splice bars	41.00 to 43.00
RR. steel car axles	46.00 to 48.00
RR. couplers and knuckles	41.00 to 42.00
No. 1 machinery cast	37.00 to 39.00
Cupola cast	33.00 to 35.00
Heavy breakable cast	32.00 to 33.00
Cast iron brake shoes	33.00 to 34.00
Cast iron car wheels	36.00 to 37.00
Malleable	40.00 to 41.00
Stove plate	31.00 to 32.00

## Philadelphia Area

No. 1 hvy. melting	\$35.00 to \$37.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 bundles	35.00 to 37.00
No. 2 bundles	31.00 to 32.00
Machine shop turn.	23.00 to 24.00
Mixed bor., short turn.	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Clean cast chem. borings	36.00 to 37.00
Low phos. 5 ft and under	40.00 to 41.00
Low phos. 2 ft and under	42.00 to 43.00
Low phos. punchings	42.00 to 43.00
Elec. furnace bundles	39.00 to 40.00
Heavy turnings	34.00 to 36.00
RR. steel wheels	47.00 to 48.00
RR. spring steel	47.00 to 48.00
Rails 18 in. and under	50.00 to 51.00
Cupola cast	36.00 to 37.00
Heavy breakable cast	38.50 to 39.50
Cast iron carwheels	43.00 to 44.00
Malleable	43.00 to 44.00
Unstripped motor blocks	29.00 to 30.00
No. 1 machinery cast	42.00 to 44.00
Charging box cast	37.00 to 38.00

## Cleveland

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	30.00 to 31.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Low phos. 2 ft and under	42.00 to 43.00
Drop forge flashings	36.00 to 37.00
No. 1 RR. hvy. melting	38.00 to 39.00
Rails 3 ft and under	48.00 to 49.00
Rails 18 in. and under	50.00 to 51.00
Railroad grate bars	33.00 to 34.00
Steel axle turnings	32.00 to 33.00
Railroad cast	43.00 to 44.00
No. 1 machinery cast	46.00 to 47.00
Stove plate	38.00 to 39.00
Malleable	44.00 to 45.00

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

## Youngstown

No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	34.00 to 35.00
Machine shop turn.	23.00 to 24.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. plate	44.00 to 45.00

## Buffalo

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	35.00 to 35.50
No. 1 busheling	39.00 to 40.00
No. 1 bundles	38.00 to 39.00
No. 2 bundles	33.00 to 33.50
Machine shop turn.	21.00 to 21.50
Mixed bor. and turn.	26.00 to 26.50
Shoveling turnings	27.00 to 27.50
Cast iron borings	26.00 to 26.50
Low phos. plate	42.00 to 42.50
Scrap rails, random lgth.	42.00 to 42.50
Rails 2 ft and under	48.00 to 49.00
RR. steel wheels	48.00 to 48.50
RR. spring steel	48.00 to 48.50
RR. couplers and knuckles	48.00 to 48.50
No. 1 machinery cast.	37.00 to 38.00
No. 1 cupola cast.	33.50 to 34.00

## Detroit

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 bundles, openhearth	34.00 to 35.00
No. 2 bundles	26.00 to 27.00
New busheling	33.00 to 34.00
Drop forge flashings	33.00 to 34.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Electric furnace bundles	34.00 to 35.00
Low phos. punch'gs, plate	34.00 to 35.00
No. 1 cupola cast.	42.00
Heavy breakable cast.	33.00
Stove plate	35.00
Automotive cast.	43.00

## St. Louis

No. 1 hvy. melting	\$33.00 to \$35.00
No. 2 hvy. melting	30.00 to 31.00
No. 2 bundled sheets	25.00 to 26.00
Machine shop turn.	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Shoveling turnings	18.00 to 20.00
No. 1 RR. hvy. melting	39.00 to 40.00
Rails, random lengths	40.00 to 41.00
Rails 18 in. and under	46.00 to 47.00
Locomotive tires, uncut	39.00 to 40.00
Angles and splice bars	40.00 to 41.00
Std. steel car axles	42.00 to 43.00
RR. spring steel	41.00 to 42.00
Cupola cast.	38.00 to 39.00
Hvy. breakable cast.	30.00 to 31.00
Cast iron brake shoes	39.00 to 40.00
Stove plate	34.00 to 35.00
Cast iron car wheels	42.00 to 43.00
Malleable	42.00 to 43.00
Unstripped motor blocks	29.00 to 30.00

## New York

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$29.50 to \$30.50
No. 2 hvy. melting	26.00 to 27.00
No. 2 bundles	24.00 to 25.00
Low phos. 2 ft and less.	32.00 to 33.00
Machine shop turn.	15.00 to 15.50
Mixed bor. and turn.	17.50 to 18.50
Shoveling turnings	19.00 to 20.00
Clean cast chem. borings	28.00 to 29.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	30.00 to 31.00
Charging box cast.	30.00 to 31.00
Heavy breakable cast.	30.00 to 31.00
Unstripped motor blocks	20.00 to 21.00

## Birmingham

No. 1 hvy. melting	\$26.00 to \$26.50
No. 2 hvy. melting	24.00 to 24.50
No. 1 bundles	26.00 to 26.50
No. 2 bundles	22.00 to 22.50
No. 1 busheling	26.00 to 26.50
Machine shop turn.	19.50 to 20.50
Shoveling turnings	20.50 to 21.50
Cast iron borings	22.75 to 23.75
Electric furnace bundles	28.00 to 28.50
Bar crops and plate	35.00 to 36.00
Structural and plate, 2 ft.	36.00 to 37.00
No. 1 RR. hvy. melting	30.00 to 30.50
Scrap rails, random lgth.	39.00 to 40.00
Rails, 18 in. and under	42.00 to 43.00
Angles & splice bars	42.00 to 43.00
Std. steel axles	43.00 to 44.00
No. 1 cupola cast.	41.00 to 42.50
Stove plate	38.00 to 39.50
Cast iron car wheels	34.00 to 35.00
Charging box cast.	29.00 to 30.00
Heavy breakable	25.00 to 26.00
Unstripped motor blocks	32.00 to 33.00
Mashed tin cans	17.00 to 18.00

## Boston

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$28.50 to \$29.00
No. 2 hvy. melting	22.00
No. 1 bundles	28.50 to 29.00
No. 2 bundles	21.00
No. 1 busheling	28.50 to 29.00
Elec. furnace, 3 ft & under	29.50 to 30.00
Machine shop turn.	13.00
Mixed bor. and short turn.	18.00
Shoveling turnings	18.00 to 19.00
Clean cast chem. borings	27.17
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	28.00 to 28.50
Heavy breakable cast.	30.00
Stove plate	24.00 to 24.50
Unstripped motor blocks	22.00

## Cincinnati

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$33.00 to \$35.00
No. 2 hvy. melting	30.00 to 32.00
No. 1 bundles	33.00 to 35.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	17.00 to 18.00
Low phos. 18 in. & under	42.00 to 43.00
Rails, random lengths	40.00 to 42.00
Rails, 18 in. and under	50.00 to 51.00
No. 1 cupola cast.	42.00 to 43.00
Hvy. breakable cast.	35.00 to 36.00
Drop broken cast.	46.90 to 47.00

## San Francisco

No. 1 hvy. melting	\$27.00
No. 2 hvy. melting	23.00
No. 1 bundles	24.00
No. 2 bundles	21.00
No. 3 bundles	17.00
Machine shop turn.	9.00
Cast iron borings	14.00
No. 1 RR. hvy. melting	27.00
No. 1 cupola cast.	39.00

## Los Angeles

No. 1 hvy. melting	\$24.00
No. 2 hvy. melting	20.00
No. 1 bundles	23.00
No. 2 bundles	20.00
No. 3 bundles	16.00
Mach. shop turn.	8.00
Shoveling turnings	12.00
Cast iron borings	12.00
Elec. fur. 1 ft and under	29.00
No. 1 RR. hvy. melting	24.00
No. 1 cupola cast.	39.00

## Seattle

No. 1 hvy. melting	\$31.00
No. 2 hvy. melting	29.00
No. 1 bundles	\$27.00 to 28.00
No. 2 bundles	28.00
No. 1 cupola cast.	37.00
Mixed yard cast.	35.00

## Hamilton Ont.

No. 1 hvy. melting	\$32.00
No. 1 bundles	32.50
No. 2 bundles	30.50
Mechanical bundles	30.50
Mixed steel scrap	28.50
Bushelings	27.50
Bush., new fact. prep'd.	30.50
Bush., new fact. unprep'd.	29.50
Short steel turnings	28.50
Mixed bor. and turn.	32.50
Rails, remelting	41.00
Rails, rerolling	48.00
Cast scrap	

# To the memory of Peter the Great



In the year 1770, a great block of solid stone weighing 1500 tons was moved into St. Petersburg as a base for the famous equestrian statue of Peter the Great. Moving of such a huge monolith would have been impossible except for a track with ball bearings, designed under the supervision of a Greek engineer.

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*Telephone ANdover 3-3900*

# Comparison of Prices

(Effective Sept. 15, 1953)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Sept. 15 1953	Sept. 8 1953	Aug. 18 1953	Sept. 16 1953
<b>Flat-Rolled Steel: (per pound)</b>				
Hot-rolled sheets	3.925¢	3.925¢	3.925¢	3.775¢
Cold-rolled sheets	4.775	4.775	4.775	4.575
Galvanized sheets (10 ga.)	5.275	5.275	5.275	5.075
Hot-rolled strip	3.925	3.925	3.925	3.725
Cold-rolled strip	5.575	5.575	5.575	5.20
Plate	4.10	4.10	4.10	3.90
Plates wrought iron	9.30	9.30	9.30	9.00
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	38.75*

<b>Tin and Terneplate: (per base box)</b>				
Tinplate (1.50 lb.) cokes	\$8.95	\$8.95	\$8.95	\$8.95
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.65
Special coated mfg. ternes	7.75	7.75	7.75	7.75

<b>Bars and Shapes: (per pound)</b>				
Merchant bars	4.15¢	4.15¢	4.15¢	3.95¢
Cold finished bars	5.20	5.20	5.20	4.925
Alloy bars	4.875	4.875	4.875	4.675
Structural shapes	4.10	4.10	4.10	3.85
Stainless bars (No. 302)	55.50	55.50	55.50	51.50*
Wrought iron bars	10.40	10.40	10.40	10.05

<b>Wire: (per pound)</b>				
Bright wire	5.525¢	5.525¢	5.525¢	5.225¢

<b>Rails: (per 100 lb.)</b>				
Heavy rails	\$4.325	\$4.325	\$4.325	\$3.775
Light rails	5.20	5.20	5.20	4.25

<b>Semifinished Steel: (per net ton)</b>				
Re-rolling billets	\$62.00	\$62.00	\$62.00	\$59.00
Slabs, re-rolling	62.00	62.00	62.00	59.00
Forging billets	75.50	75.50	75.50	70.50
Alloy blooms, billets, slabs	82.00	82.00	82.00	76.00

<b>Wire Rod and Skelp: (per pound)</b>				
Wire rods	4.525¢	4.525¢	4.525¢	4.325¢
Skelp	3.75	3.75	3.75	3.55

<b>Finished Steel Composite: (per pound)</b>				
Base price	4.634¢	4.634¢	4.634¢	4.376¢

\* Add 4.7 pct.

## Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mail.	Bess.	Low Phos.
Bethlehem B3	58.00	58.50	59.00	59.50	
Birmingham R3	52.38	52.88			
Birmingham W9	52.38	52.88			
Birmingham S5	52.38	52.88			
Buffalo R3	56.00	56.50	57.00		
Buffalo H1	56.00	56.50	57.00		
Buffalo W6	56.00	56.50	57.00		
Chicago A5	56.00	56.50	56.50	57.00	
Cleveland R3	56.00	56.50	56.50	57.00	61.00
Dangerfield L3	52.50	52.50	52.50		
Duluth H4	56.00	56.50	56.50	57.00	
Erie H4	56.00	56.50	56.50	57.00	
Everett M6		63.25	63.75		
Fantana K1	62.00	62.50			
Geneva, Utah C7	56.00	56.50	56.50	57.00	61.00
Granite City G2	57.90	58.40	58.90		
Hubbard Y1			56.50		
Minnequa C6	58.00	59.00	59.00		
Monessen P6	56.00				
Neville Isl. P4	56.00	56.50	56.50		
Pittsburgh U1	56.00			57.00	
Sharpsville S3	56.00	56.50	56.50	57.00	
Steelton B3	58.00	58.50	59.00	59.50	64.00
Swedeland A2	60.00	60.50	61.00	61.50	
Toledo H4	56.00	56.50	56.50	57.00	
Troy, N. Y. R3	58.00	58.50	59.00	59.50	64.00
Youngstown Y1			56.50	57.00	
N. Tonawanda T1		56.50	57.00		

**DIFFERENTIALS:** Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over.

**Silvery Iron:** Buffalo, H1, \$68.25; Jackson, J1, G1, \$67.00. Add \$1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add \$1 per ton for 0.75 pct or more phosphorus. Manganese as above. Bessemer ferrosilicon prices are \$1 over comparable silvery iron.

	Sept. 15 1953	Sept. 8 1953	Aug. 18 1953	Sept. 16 1953
<b>Pig Iron: (per gross ton)</b>				
Foundry, del'd Phila.	\$62.10	\$62.10	\$62.10	\$60.00
Foundry, Valley	56.50	56.50	56.50	55.00
Foundry, Southern, Cin'ti	60.43	60.43	60.43	58.93
Foundry, Birmingham	52.88	52.88	52.88	51.38
Foundry, Chicago†	56.50	56.50	56.50	55.00
Basic del'd, Philadelphia	61.27	61.27	61.27	59.77
Basic, Valley furnace	56.00	56.00	56.00	54.50
Malleable, Chicago†	56.50	56.50	56.50	55.00
Malleable, Valley	56.50	56.50	56.50	55.00
Ferromanganese, cents per lb.	10.00¢	10.00¢	10.00¢	8.96¢

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡ Average of U. S. Prices quoted on Ferroalloy pages, 76 pct Mn basis

<b>Pig Iron Composite: (per gross ton)</b>				
Pig iron	\$56.76	\$56.76	\$56.76	\$55.26

<b>Scrap: (per gross ton)</b>				
No. 1 steel, Pittsburgh	\$40.50	\$41.50	\$44.50	\$43.00*
No. 1 steel, Phila. area	36.00	38.50	42.50	41.50*
No. 1 steel, Chicago	35.00	36.00	42.50	41.50*
No. 1 bundles, Detroit	34.50	36.50	40.50	41.15*
Low phos., Youngstown	40.50	46.50	48.50	46.50*
No. 1 mach'y cast, Pittsburgh	47.50	47.50	49.50	52.00
No. 1 mach'y cast, Philadel'a	43.00	44.50	45.50	52.00†
No. 1 mach'y cast, Chicago	38.00	39.00	45.00	48.50

\* Basing pt., less broker's fee. † Shipping pt., less broker's fee.

<b>Steel Scrap Composite: (per gross ton)</b>				
No. 1 heavy melting scrap	\$37.17	\$38.67	\$43.17	\$42.00

<b>Coke, Connellsville: (per net ton at oven)</b>				
Furnace coke, prompt	\$14.38	\$14.75	\$14.75	\$14.75
Foundry coke, prompt	17.25	17.25	17.25	17.75

<b>Nonferrous Metals: (cents per pound to large buyers)</b>				
Copper, electrolytic, Conn.	29.50†	29.50†	29.25†	24.50
Copper, Lake, Conn.	30.125	30.125	30.125	24.625
Tin, Straits, New York	82.00†	83.00*	83.00	81.21%
Zinc, East St. Louis	10.00	10.50	11.00	14.50
Lead, St. Louis	13.80	13.80	13.80	15.30
Aluminum, virgin ingot	21.50	21.50	21.50	20.00
Nickel, electrolytic	63.08	63.08	63.08	60.58
Magnesium, ingot	27.00	27.00	27.00	24.50
Antimony, Laredo, Tex.	34.50	34.50	34.50	39.00

† Tentative. ‡ Average. \* Revised.

## Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

## Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

## STAINLESS STEELS

Base price cents per lb., f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingets, re-rolling	16.25	17.25	18.75	18.25	28.00	22.75	24.50	14.00		14.25
Slabs, billets, re-rolling	20.50	22.75	24.75	23.75	36.25	29.50	32.25	18.25		18.50
Forg. discs, die blocks, rings	38.50	35.50	41.50	40.50	60.00	45.50	50.75	31.00	31.75	31.75
Billets, forging	29.50	29.75	32.25	31.00	46.50	35.25	38.50	24.00	24.50	24.50
Bars, wires, structurals	35.25	35.50	38.25	37.25	55.50	42.00	46.75	28.75	29.25	29.25
Plates	37.25	37.50	39.75	39.75	59.00	45.75	51.25	30.00	30.50	30.50
Sheets	37.50	37.50	39.75	39.75	64.50	55.50	60.75	40.75	41.25	41.50
Strip, hot-rolled	29.75	32.00	36.75	34.25	55.00	42.00	46.50	26.25		27.00
Strip, cold-rolled	38.25	41.50	45.50	43.75	66.50	54.50	59.25	34.25	41.25	34.75

**STAINLESS STEEL PRODUCING POINTS—Sheets:** Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2; (type 316 add 4.5¢) J2; Baltimore, E1; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., J2; Ft. Wayne, J4; Lockport, N. Y., R4.

**Strip:** Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; (type 316 add 4.5¢); W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C5; Lockport, N. Y., S4; Sharon, Pa., S1 (type 301 add 3/4¢); Butler, Pa., A7; Wallingford, Conn., W1.

**Bars:** Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A3; Lockport, N. Y., S4; Canton, O., T5; Ft. Wayne, J4.

**Wire:** Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2.

**Structurals:** Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11.

**Plates:** Brackenridge, Pa., A3; Butler, Pa., A7; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., J2; Lockport, N. Y., S4; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3.

**Forged discs, die blocks, rings:** Pittsburgh, C11; Syracuse, C11; Ferndale, Mich., A3; Washington, Pa., J2.

**Forging billets:** Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11.





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duction) were swaged in that period! Production has been maintained at that level since.

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W&D 4691

**STEEL  
PRICES**(Effective  
Sept. 15, 1958)

EAST

MIDDLE WEST

WEST

SOUTH

	INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PIL- ING	SHAPES STRUCTURALS		STRIP			
	Carbon Forging Net Ton	Alloy Net Ton	Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
Bethlehem, Pa.					\$82.00 B3			4.15 B3	6.20 B3				
Buffalo, N. Y.			\$62.00 B3	\$75.50 B3, R3	\$82.00 B3, R3		4.925 B3	4.15 B3	6.20 B3	3.925 B3, R3	5.45 B3	6.00 B3	6.425 B3
Claymont, Del.													
Coatesville, Pa.													
Conschohocken, Pa.										4.05 A2		6.20 A2	
Harrisburg, Pa.													
Hartford, Conn.													
Johnstown, Pa.			\$62.00 B3	\$75.50 B3	\$82.00 B3			4.15 B3	6.20 B3				
Morrisville, Pa.													
New Haven, Conn.											5.95 A5 6.20 D1		
Phoenixville, Pa.								4.95 P2					
Sparrows Pt., Md.										3.925 B3	5.45 B3	6.00 B3	6.425 B3
Worcester, Mass.													
Trenton, N. J.													
Alton, Ill.										4.20 L1			
Ashland, Ky.										3.925 A7			
Canton-Massillon, Dover, Ohio				\$75.50 R3	\$82.00 R3								
Chicago, Ill.			\$62.00 U1	\$75.50 R3, U1, W8	\$82.00 U1, W8, R3		4.925 U1	4.10 U1, W8	6.175 U1, Y1	3.925 A1, W8	5.95 A1	5.95 R3	
Sterling, Ill.													
Cleveland, Ohio				\$75.50 R3							5.45 A5, J3		7.00 J3 6.15 A5
Detroit, Mich.		\$63.00 R5		\$78.50 R5	\$84.00 R5					4.225 G3 4.40 M2	5.65 G3, M2 5.95 D1 6.05 D2	6.50 G3	7.90 D2 6.50 G3
Duluth, Minn.													
Gary, Ind. Harbor, Indiana			\$62.00 U1	\$75.50 U1	\$82.00 U1, Y1		4.925 J3	4.10 J3, U1	6.175 U1, J3	3.925 J3, U1, Y1	5.70 J3	5.95 U1, J3 6.45 Y1	
Granite City, Ill.													
Kokomo, Ind.													
Mansfield, Ohio											5.95 E2		
Middletown, Ohio											5.45 A7		
Niles, Ohio Sharon, Pa.										4.225 S1	5.80 S1	5.96 S1	7.65 S1
Pittsburgh, Pa. Midland, Pa.	\$59.00 U1	\$62.00 U1	\$62.00 U1 \$62.50 J3	\$75.50 J3 U1	\$82.00 U1	3.75 U1 3.85 J3	4.925 U1	4.10 J3, U1	6.175 J3, U1	4.425 S7, S9 3.925 A7	5.45 B4 J3 6.15 S7		7.80 J3
Portsmouth, Ohio													
Weirton, Wheeling, Follansbee, W. Va.								4.35 W3		4.025 W3	5.45 F3, W3	6.30 W3	6.30 W3
Youngstown, Ohio					\$82.00 Y1, C10	3.75 R3, U1		4.10 Y1	6.675 Y1	3.925 R3, U1, Y1	5.45 R3, Y1 5.50 C5	5.95 U1, R3 6.45 Y1	7.00 R3 6.30 Y1
Fontana, Cal.	\$86.00 K1	\$88.00 K1	\$81.00 K1	\$84.50 K1	\$101.00 K1			4.75 K1	6.825 K1	4.70 K1	7.35 K1	7.00 K1	
Geneva, Utah				\$78.50 C7				4.10 C7	6.175 C7				
Kansas City, Mo.								4.80 S2	6.875 S2	4.625 S2		6.65 S2	
Los Angeles, Torrance, Cal.				\$94.50 B2	\$102.00 B2			4.80 B2, C7	6.85 B2	4.675 B2, C7	7.50 C1		
Minneapolis, Colo.								4.55 C6		4.025 C6			
San Francisco, Niles, Pittsburg, Cal.				\$94.50 B2				4.75 B2 4.91 P9	6.80 B2	4.675 B2, C7			
Seattle, Wash.				\$94.50 B2, S11				4.85 B2	6.90 B2				
Atlanta, Ga.										4.175 A8			
Fairfield, Ala. Alabama City, Ala.			\$62.00 T2	\$75.50 T2				4.10 R3, T2	6.175 T2	3.925 R3, T2		5.95 T7	
Houston, Texas				\$85.50 S2	\$92.00 S2			4.60 S2		4.425 S2			

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

# STEEL PRICES

(Effective Sept. 15, 1953)

## SHEETS

## WIRE ROD

## TINPLATE†

## BLACK PLATE

Hot-rolled 10 ga. & heavy	Cold- rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Tens 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot- rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.	
3.925 B3	4.775 B3				5.90 B3	7.225 B3			4.525 W6				Bethlehem, Pa.
													Buffalo, N. Y.
													Claymont, Del.
4.05 A2					6.15 A2								Coatesville, Pa.
													Conschocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
													Johnstown, Pa.
4.05 U1	4.875 U1								4.525 B3				Morrisville, Pa.
													New Haven, Conn.
													Phoenixville, Pa.
3.925 B3	4.775 B3	5.275 B3			5.90 B3	7.225 B3	8.075 B3		4.625 B3	\$8.90 B3	\$7.50 B3		Sparrows Pt., Md.
									4.825 A5				Worcester, Mass.
													Trouton, N. J.
3.925 A7		5.275 A7	5.175 A7						4.70 L1				Alton, Ill.
		5.275 R3 5.675 R1						5.825 R1					Ashland, Ky.
3.925 A1, W8					5.90 U1				4.525 A5, N4, R3				Canton-Massillon, Dover, Ohio
									4.625 N4				Chicago, Ill.
3.925 J3, R3	4.775 J3, R3		5.175 R3		5.90 J3, R3	7.225 J3, R3			4.525 A5				Sterling, Ill.
4.125 G3	4.975 G3				6.375 G3	7.675 G3							Cleveland, Ohio
													Detroit, Mich.
													Duluth, Minn.
3.925 J3, U1, Y1	4.775 J3, U1, Y1	5.275 U1 5.325 J3	5.175 J3, U1	5.675 U1	5.90 U1, J3 6.40 Y1	7.225 U1 7.725 Y1				\$8.70 J3, U1, Y1	\$7.40 J3, U1	6.10 U1, Y1	Gary, Ind. Harbor, Indiana
4.30 G2	5.27 G2	5.475 G2	5.875 G2								\$7.60 G2	6.30 G2	Granite City, Ill.
		5.375 C9											Kokomo, Ind.
				6.25 E2				5.80 E2					Mansfield, Ohio
	4.775 A7		5.175 A7	5.675 A7									Middletown, Ohio
4.225 S1 5.425 N3	5.80 N3		6.775 N3	5.45 S1 6.00 N3	5.90 S1						\$7.40 R3		Niles, Ohio Sharon, Pa.
3.925 J3, U1, P4, A7	4.775 J3, U1	5.275 U1	5.175 U1		5.90 J3, U1	7.225 J3, U1	7.925 U1		4.525 A5 4.725 P6	\$8.70 J3, U1	\$7.40 J3, U1	6.10 U1	Pittsburgh, Pa. Midland, Pa.
									4.725 P7				Perkins, Ohio
3.925 W3, W5	4.775 W3, W5 5.775 F3	5.275 W3, W5		5.675 W3, W5	6.175 W3	7.475 W3				\$8.70 W3, W5	\$7.40 W3, W5	6.55 W3 6.10 F3	Weirton, Wheeling, Follansbee, W. Va.
3.925 R3, U1, Y1	4.775 R3, Y1	5.175 Y1			5.90 U1, R3 6.40 Y1	7.225 R3 7.725 Y1			4.525 Y1	\$8.70 R3			Youngstown, Ohio
4.70 K1	5.875 K1				7.00 K1	8.275 K1			5.325 K1				Fontana, Cal.
4.825 C7													Geneva, Utah
								4.775 C6	4.865 S2				Kansas City, Mo.
4.825 C7		6.275 C7						5.325 B2					Los Angeles, Torrance, Cal.
									4.775 C6				Minneapolis, Colo.
4.625 C7	5.725 C7	6.825 C7							5.175 C7	\$9.45 C7	\$8.15 C7		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.925 R3, T2	4.775 T2	5.275 R3, T2			5.90 T2			5.125 T2 5.225 R3	4.525 T2, R3	\$8.80 T2	\$7.50 T2		Fairfield, Ala. Alabama City, Ala.
4.825 S2									4.925 S2				Houston, Texas



## IRON AGE

STEEL  
PRICES(Effective  
Sept. 15, 1953)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	
EAST	Bethlehem, Pa.				4.875 B3	6.325 B3	6.225 B3					
	Buffalo, N. Y.	4.15 B3,R3	4.15 B3,R3	5.25 B5	4.875 B3,R3	6.325 B3 6.325 B5	6.225 B3	4.10 B3			6.25 B3	5.525 W6
	Claymont, Del.							4.55 C4		5.65 C4		
	Coatesville, Pa.							4.35 L4		5.75 L4		
	Conschocken, Pa.							4.55 A2	5.15 A2		6.50 A2	
	Harrisburg, Pa.							6.50 C3				
	Hartford, Conn.			5.75 R3		6.775 R3						
	Johnstown, Pa.	4.15 B3	4.15 B3		4.875 B3		6.225 B3	4.10 B3		5.55 B3	6.25 B3	5.525 B3
	Newark, N. J.			5.65 W10		6.65 W10						
	New Haven, Conn.											
	Camden, N. J.			5.65 P10		6.50 P10						
	Putnam, Conn.			5.75 W10								
	Sparrows Pt., Md.		4.15 B3					4.10 B3		5.55 B3	6.25 B3	5.625 B3
	Palmer, Worcester, Mansfield, Mass.			5.75 B5 6.10 W11		6.775 B5						5.825 A5, W6
	Readville, Mass.			5.75 C14								
MIDDLE WEST	Alton, Ill.											
	Ashland, Ky.							4.10 A7				
	Canton-Massillon, Ohio	4.15 R3		5.20 R2,R3	4.875 R3	6.325 R2,R3						
	Chicago, Ill.	4.15 R3, U1, N4,W8	4.15 R3,N4	5.20 A5,W10, W8,B5,L2	4.875 U1, W8,R3	6.325 A5,W8, W10,L2,R3, B5		4.10 U1,W8	5.15 U1	5.55 U1	6.25 U1	5.525 A5, R3,N4,W7
	Cleveland, Ohio	4.15 R3	4.15 R3	5.20 A5,C13		6.325 A5,C13		4.10 J3,R3	5.15 J3		6.25 J3	5.525 A5, R3,C13
	Detroit, Mich.	4.30 R5 4.50 G3		5.35 R5,P8 5.40 B5 5.45 P3	.975 R5 5.225 G3	6.425 R5 6.475 P8 6.525 B5,P3	6.875 G3	4.65 G3			7.10 G3	
	Duluth, Minn.											5.625 A5
	Gary, Ind. Harbor, Crawfordsville, Indiana	4.15 I3, U1, Y1	4.15 I3, U1, Y1	5.20 R3	4.875 I3, U1, Y1	6.325 R3,M5	6.225 U1, I3 6.725 Y1	4.10 I3, U1, Y1	5.15 I3	5.55 U1	6.25 U1, I3 6.75 Y1	5.625 M4
	Granite City, Ill.							4.60 G2				
	Kokomo, Ind.											5.625 C9
	Sterling, Ill.	4.25 N4	4.25 N4									5.625 N4
	Niles, Ohio Sharon, Pa.							4.10 S1		5.70 S1	6.25 S1	
	Pittsburgh, Pa. Midland, Pa.	4.15 J3, U1	4.15 J3, U1	5.20 A5,J3, W10,R3,C8	4.875 U1,C11	6.325 A5, W10,C8	6.225 J3, U1	4.10 J3, U1	5.15 U1	5.55 U1	6.25 J3, U1	5.525 A5, J3,P6
	Portsmouth, Ohio											5.725 P7
	Weirton, Wheeling, Follansbee, W. Va.	4.30 W3						4.40 W3				
	Youngstown, Ohio	4.15 R3, U1, Y1	4.15 R3, U1, Y1	5.20 Y1,F2	4.875 U1, Y1, C10	6.325 Y1, C10,F2	6.225 U1 6.725 Y1	4.10 R3, U1, Y1			6.75 Y1	5.525 Y1
WEST	Emeryville, Cal.	4.90 J5	4.90 J5									
	Fontana, Cal.	4.85 K1	4.85 K1		5.925 K1		7.475 K1	4.75 K1		6.60 K1	6.95 K1	
	Geneva, Utah							4.10 C7			6.25 C7	
	Kansas City, Mo.	4.85 S2	4.85 S2		5.575 S2		6.925 S2					6.125 S7
	Los Angeles, Torrance, Cal.	4.85 B2,C7	4.85 B2,C7	6.65 R3	5.925 B2		6.925 B2					6.475 B2
	Minneapolis, Colo.	4.60 C6	4.75 C6					4.95 C6				5.775 C6
	Portland, Ore.	4.90 O2										
	San Francisco, Niles, Pittsburg, Cal.	4.85 C7,P9 4.90 B2	4.85 C7,P9 4.90 B2				6.975 B2					6.475 C7
	Seattle, Wash.	4.90 B2,N6	4.90 B2,S11				6.975 B2	5.00 B2			7.15 B2	
	Atlanta, Ga.	4.40 A8	4.40 A8									5.775 A8
SOUTH	Fairfield, Ala. Alabama City, Ala.	4.15 R3,T2	4.15 R3,T2				6.225 T2	4.10 R3,T2			6.25 T2	5.525 R3, T2
	Houston, Texas Ft. Worth, Texas	4.65 S2	4.65 S2		5.375 S2			4.60 S2				5.925 S1

# Steel Prices

(Effective Sept. 15, 1953)

## Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago  
A2 Alan Wood Steel Co., Conshohocken, Pa.  
A3 Allegheny Ludlum Steel Corp., Pittsburgh  
A4 American Cladmetal Co., Carnegie, Pa.  
A5 American Steel & Wire Div., Cleveland  
A6 Angell Nail & Chaplet Co., Cleveland  
A7 Arco Steel Corp., Middletown, O.  
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.  
B2 Bethlehem Pacific Coast Steel Corp., San Francisco  
B3 Bethlehem Steel Co., Bethlehem, Pa.  
B4 Blair Strip Steel Co., New Castle, Pa.  
B5 Blas & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles  
C2 Carpenter Steel Co., Reading, Pa.  
C3 Central Iron & Steel Co., Harrisburg, Pa.  
C4 Claymont Products Dept., Claymont, Del.  
C5 Cold Metal Products Co., Youngstown  
C6 Colorado Fuel & Iron Corp., Denver  
C7 Columbia Geneva Steel Div., San Francisco  
C8 Columbia Steel & Shafting Co., Pittsburgh  
C9 Continental Steel Corp., Kokomo, Ind.  
C10 Copperweld Steel Co., Glassport, Pa.  
C11 Crucible Steel Co. of America, New York  
C12 Cumberland Steel Co., Cumberland, Md.  
C13 Cuyahoga Steel & Wire Co., Cleveland  
C14 Compressed Steel Shafting Co., Readville, Mass.

D1 Detroit Steel Corp., Detroit  
D2 Detroit Tube & Steel Div., Detroit  
D3 Driver Harria Co., Harrison, N. J.  
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore  
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.  
F2 Fitzsimmons Steel Corp., Youngstown  
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.  
G2 Granite City Steel Co., Granite City, Ill.

G3 Great Lakes Steel Corp., Detroit

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago  
I3 Inland Steel Co., Chicago  
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.  
J2 Jessop Steel Corp., Washington, Pa.  
J3 Jones & Laughlin Steel Corp., Pittsburgh  
J4 Joslyn Mfg. & Supply Co., Chicago  
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.  
K2 Keystone Steel & Wire Co., Peoria  
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis  
L2 La Salle Steel Co., Chicago  
L3 Lone Star Steel Co., Dallas  
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.  
M2 McLouth Steel Corp., Detroit  
M3 Mercer Tube & Mfg. Co., Sharon, Pa.  
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.  
M5 Monarch Steel Co., Inc., Hammond, Ind.  
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh  
N2 National Tube Co., Pittsburgh  
N3 Niles Rolling Mill Div., Niles, O.  
N4 Northwestern Steel & Wire Co., Sterling, Ill.  
N5 Newport Steel Corp., Newport, Ky.  
N6 Northwest Steel Rolling Mill, Seattle

O1 Oliver Iron & Steel Co., Pittsburgh  
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.  
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.  
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.  
P4 Pittsburgh Coke & Chemical Co., Pittsburgh  
P5 Pittsburgh Screw & Bolt Co., Pittsburgh  
P6 Pittsburgh Steel Co., Pittsburgh  
P7 Portsmouth Div., Detroit Steel Corp., Detroit

P8 Plymouth Steel Co., Detroit

P9 Pacific States Steel Co., Niles, Cal.

P10 Precision Drawn Steel Co., Camden, N. J.

R1 Reeves Steel & Mfg. Co., Dover, O.  
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.  
R3 Republic Steel Corp., Cleveland  
R4 Roebbing Sons Co., John A., Trenton, N. J.  
R5 Rotary Electric Steel Co., Detroit

S1 Sharon Steel Corp., Sharon, Pa.  
S2 Sheffield Steel Corp., Kansas City  
S3 Shenango Furnace Co., Pittsburgh  
S4 Simonds Saw & Steel Co., Fitchburg, Mass.  
S5 Sloss Sheffield Steel & Iron Co., Birmingham

S6 Standard Forging Corp., Chicago  
S7 Stanley Works, New Britain, Conn.  
S8 Superior Drawn Steel Co., Monaca, Pa.  
S9 Superior Steel Corp., Carnegie, Pa.

S10 Sweet's Steel Co., Williamsport, Pa.  
S11 Seidelhuber Steel Rolling Mills, Seattle

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.  
T2 Tennessee Coal & Iron Div., Fairfield  
T3 Tennessee Products & Chem. Corp., Nashville  
T4 Thomas Strip Div., Warren, O.  
T5 Timken Steel & Tube Div., Canton, O.  
T6 Tremont Nail Co., Wareham, Mass.

T7 Texas Steel Co., Fort Worth  
U1 United States Steel Corp., Pittsburgh  
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

W1 Wallingford Steel Co., Wallingford, Conn.  
W2 Washington Steel Corp., Washington, Pa.  
W3 Weirton Steel Co., Weirton, W. Va.  
W4 Wheatland Tube Co., Wheatland, Pa.  
W5 Wheeling Steel Corp., Wheeling, W. Va.  
W6 Wickwire Spencer Steel Div., Buffalo  
W7 Wilson Steel & Wire Co., Chicago  
W8 Wisconsin Steel Co., S. Chicago, Ill.  
W9 Woodward Iron Co., Woodward, Ala.  
W10 Wyckoff Steel Co., Pittsburgh  
W11 Worcester Pressed Steel Co., Worcester, Mass.

Y1 Youngtown Sheet & Tube Co., Youngstown

## PIPE AND TUBING

Base discounts (per) f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD										SEAMLESS							
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2 In.		3 In.		3 1/2-4 In.	
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
STANDARD T. & C.																		
Sparrows Pt. B3	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0				
Youngtown R3	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0				
Fontana K1	13.25	+2.0	16.25	1.0	18.75	4.5	21.25	5.5	21.75	6.5	22.25	7.0	23.75	7.0				
Pittsburgh J3	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5
Alton, Ill. L1															22.25	5.0	23.75	6.5
Sharon M3	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0				
Pittsburgh N1	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5
Wheeling W5	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0				
Wheatland W4	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0				
Youngtown Y1	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5
Indiana Harbor Y1	25.25	9.0	28.25	13.0	30.75	16.5	33.25	17.5	33.75	18.5	34.25	19.0	35.75	19.0				
Lorain N2	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5
EXTRA STRONG PLAIN ENDS																		
Sparrows Pt. B3	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0				
Youngtown R3	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0				
Fontana K1	16.75		20.75		22.75		23.25		23.75		24.25		24.75					
Pittsburgh J3	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75
Alton, Ill. L1															23.75	6.75	28.75	9.75
Sharon M3	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0				
Pittsburgh N1	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75
Wheeling W5	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0				
Wheatland W4	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0				
Youngtown Y1	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75
Indiana Harbor Y1	28.75	14.0	32.75	18.0	34.75	21.5	35.25	20.5	35.75	21.5	36.25	22.0	36.75	21.0				
Lorain N2	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75

Galvanized discounts based on zinc, at 11¢ per lb. East St. Louis. For each 1¢ change in zinc, discounts vary as follows: 1/2 in., 3/4 in., and 1 in., 1 pt.; 1 1/4 in., 1 1/2 in., 2 in., 3/4 pt.; 2 1/2 in., 3 in., 1/2 pt. Calculate discounts on even cents per lb. of zinc, i.e., if zinc is 16.5¢ to 17.5¢ per lb. use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only butt-weld and seamless, 3/4 pts. higher discount. Plain ends, butt-weld and seamless, 3 in. and under, 4 1/2 pts. higher discount. Butt-weld jobbers' discount, 5 pct. East St. Louis zinc price now 10.5¢.

(Effective Sept. 15, 1953)

## MERCHANT WIRE PRODUCTS

	Standard & Coated Nails					
F.o.b. Mill	Col	Col	Col	Col	Col	#lb.
	Woven Wire Fence 9-15½ ga. 10" Fence Posts	Single Loop Balo Ties	Twisted Barbless Wire	Gals. Barbed Wire	Mech. Wire Ann'd	Mech. Wire "Gals"
Alabama City R3	131	140		149	153	6.675 T.
Aliquippa, Pa. J3	131	143			150	6.675 T.
Atlanta A8	134	146		152	159	6.925 T.
Bartonville K2	131	143			156	
Buffalo W6						
Chicago, Ill. N4	131	143		149	156	6.675 T.
Cleveland A6	137					6.675
Crawfordsv. M4	133	145		151	153	6.775 T.
Danora, Pa. A5	131	140		149	153	6.675 T.
Duluth A5	131	140	138	149	153	6.675 T.
Fairfield, Ala. T2	131	140		149	153	6.675 T.
Galveston D4	139	148				
Houston S2	139	151			164	7.075 T.
Johnstn., Pa. B3	131	143	145	156	156	6.675 T.
Joliet, Ill. A5	131	140		149	153	6.675 T.
Kokomo, Ind. C9	133	142		151	155	6.775 T.
Los Angeles B2	143	155		161	168	7.275 T.
Kansas City S2	136	145		154	162	6.925 T.
Minnequa C6	131	145		151	157	6.675 T.
Monessen P6						
Moline, Ill. R3	131	145		154		6.675
Pittsburg, Cal. C7	150	163	173	173	173	6.625 B.
Portsmouth P7	132					6.575
Rankin, Pa. A5	131	140		149	153	6.675 T.
Sac. Chicago R3	131	140	145	149	153	6.675 T.
S. San Fran. C6					173	
Sparrrows Pt. B3	133			151	158	6.775 T.
Struthers, O. Y1						6.675 T.
Westchester A5	137					6.975
Williamsport, Pa. S10	133		158			

F.o.b. m(II)

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	\$1.66
18	4	1	—	5	2.34
18	4	2	—	—	1.82
1.5	4	1	8	—	.895
6	4	2	6	—	1.055
High-carbon chromium .....					.70
Oil hardened manganese .....					.39
Special carbon .....					.355
Extra carbon .....					.30
Regular carbon .....					.25

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

Base price, f.o.b., dollars per 100 lb.

\* Alabama City and So. Chicago don't include zinc extra. Galvanized products computed with zinc at 11.8¢ per lb.

Cents Per Lb. F.o.b. Mill	CARBON CONTENT				
	0.20-	0.41-	0.61-	0.81-	1.00-
	0.40	0.60	0.80	1.05	1.35
Bridgeport, Conn. <i>S7</i> .....	6.15	8.00	8.60	10.55	12.85
Carnegie, Pa. <i>S9</i> .....		8.00	8.60	10.55	12.85
Cleveland <i>A5</i> .....	5.45	7.65	8.60	10.55	12.85
Detroit <i>D2</i> .....	6.05	8.25	8.85		
Harrison, N. J. <i>C11</i> .....			8.90	10.85	13.15
New Castle, Pa. <i>B4</i> .....	5.80	8.00	8.60		
New Haven, Conn. <i>D1</i> .....	6.70	7.95	8.55	10.50	
Sharon, Pa. <i>S1</i> .....	5.80	8.00	8.60	10.55	12.85
Trouton <i>R4</i> .....		7.95	8.55	10.50	12.80
Weirton, W. Va. <i>W3</i> .....	5.80	8.00	8.60	10.55	12.85
Worcester, Mass. <i>A5</i> .....	5.75	7.95	8.90	10.85	13.15
Youngstown <i>C5</i> .....		8.00	8.60	10.55	12.85

\* Sold on Pittsburgh base.

\$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox...	2	13	30.68	36.28	26.51	31.90
	2 1/2	12	40.51	48.86	35.70	43.07
	3	12	45.92	55.39	.....	49.73
	3 1/2	11	53.60	64.65	48.13	56.06
	4	10	65.91	79.50	63.92	77.10
National Tube.....	2	13	.....	32.98	24.85	.....
	2 1/2	12	36.82	44.41	33.50	.....
	3	12	42.52	51.28	38.00	.....
	3 1/2	11	49.63	59.87	45.16	.....
	4	10	65.91	79.50	59.97	.....
Pittsburgh Steel....	2	13	27.34	32.98	.....	.....
	2 1/2	12	36.82	44.41	.....	.....
	3	12	42.52	51.28	.....	.....
	3 1/2	11	49.63	59.87	.....	.....
	4	10	65.91	79.50	.....	.....

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1) 500 to 1499 lb. (2) 20,000 lb or over. (3) 450 to 1499 lb. (4) 500 to 9999 lb. (5) 1000 lb or over.



## Miscellaneous Prices —

(Effective Sept. 15, 1953)

### RAILS, TRACK SUPPLIES

Fab. Mill Cuts Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer U1	4.325	5.20	5.275				
Chicago R3				7.05			
Cleveland R3							
Easter T1	4.325	5.20				5.125	
Fairfield T2		5.20				5.125	
Gary U1	4.325	5.20				5.125	
Ind. Harbor B3	4.325		5.275	7.05			
Johnstown B3		5.20					
Joliet U1		5.20	5.275				
Kansas City S2				7.30		11.00	
Lackawanna B3	4.325	5.20	5.275			5.125	
Lakeland B3				7.05	10.50	11.00	
Minehead C6	4.325	5.70		7.05	11.55	10.35	
Pittsburgh O1					10.50	11.00	
Pittsburgh P5						11.00	
Pittsburgh J3				7.05			
Pitt. Cal. C7						5.275	
Seattle B2				7.55		5.275	11.50
Stanton B3	4.325		5.275			5.125	
Struthers Y1						5.275	
Terrace C7							
Youngstown R3				7.05			

### LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953 to end of season.

	Gross Ton
Openhearth lump	\$11.15
Old range, bessemer	10.30
Old range, nonbessemer	10.15
Mesabi, bessemer	10.05
Mesabi, nonbessemer	9.90
High phosphorus	

Prices based on upper Lake rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

### COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	\$14.25 to \$14.50
Foundry beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.50 to \$17.00
Foundry, oven coke	
Buffalo, del'd	\$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, del'd	23.21
Lone Star, Tex., f.o.b.	18.50

### ELECTRODES

Cents per lb, f.o.b. plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
GRAPHITE		
24	84	20.50
18, 20	72	20.00
12, 14	72	20.50
7 to 10	60	21.00
6	60	23.25
4	40	26.00
3	40	27.50
2 1/2	30	28.00
2	24	43.50
CARBON		
40	100, 110	8.95
35	110	8.95
30	110	8.95
24	72 to 84	9.10
20	90	8.95
17	72	9.10
14	72	9.50
10, 12	60	10.30
8	60	10.55

# IDEAL

## FOR WAREHOUSES, FOUNDRIES, ASSEMBLY FLOORS, ETC.



**A 3 Motor-  
double girder  
floor controlled  
EUCLID CRANE  
underslung from  
3 roof girders**

This crane is ideal for buildings wherein head-room is a factor and maximum lateral movement is desired.

It's a three-motor, floor-controlled crane suspended from three I-beams. Note that the bridge clears the side columns by mere inches.

This permits the trolley to travel unusually close to the walls affording maximum use of the floor area.

There is a Euclid Crane to handle all conventional and unusual operations—or we'll design one to do the job.



### THE EUCLID CRANE & HOIST CO.

1361 CHARDON ROAD • EUCLID, OHIO

Compressed gas cylinders or tanks are continuously normalized and annealed—scale-free in EF gas fired furnaces.

Bolts, springs and other products are scale-free heat treated in EF continuous chain belt conveyor furnaces. It sizes—to handle from 125 to 2000 lbs. more per hour.

# PRODUCTION FURNACES

for these and other processes

Reflecting more than 30 years of continuous research experience and outstanding engineering accomplishments, EF production furnaces combine high heating efficiency—accurate, automatically controlled cycles—high fuel economy—and produce products with uniform physicals and surface finish year after year. For advanced engineering designs that minimize maintenance and produce high hourly outputs, turn your production furnace problems over to one of the experienced EF furnace engineers—it pays.

## THE ELECTRIC FURNACE CO.

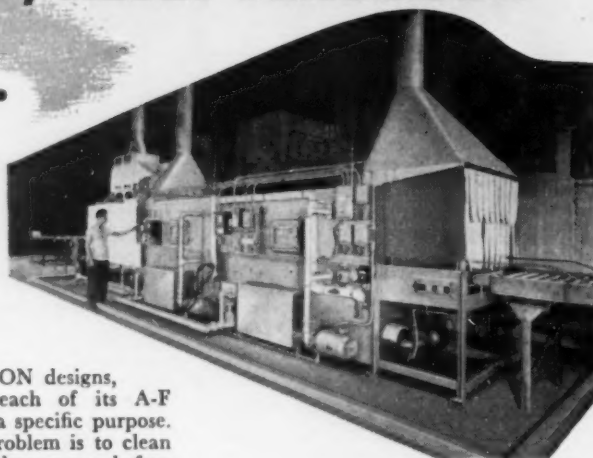
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by **ALVEY-FERGUSON**

To wash...  
rinse...  
dry...  
cartridge  
cases



ALVEY-FERGUSON designs, engineers and builds each of its A-F Washing Machines for a specific purpose. Whether your plant's problem is to clean lubricants from cartridge cases before annealing, to clean and dry miscellaneous ball bearing parts without the use of baskets, remove all chips from diesel motor blocks or some other phase of quality control in your metal parts or products operation, you'll find your A-F Washing Machine as highly specialized

for your specific needs as any precision equipment now in your plant. Why be satisfied with less?

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For  
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Speeds,  
and Heavier  
Feeds

ARMSTRONG Carbide Tool  
Holders and ARMIDE (Carbide

Tipped) Cutters come in cased sets for tool rooms and maintenance departments, and individually in all sizes for general machine shop and production turning. They permit not only the ready machining of sand-filled castings, the hardest and toughest steels as well as many heretofore "unmachinable" materials, but also make practical much heavier cuts and cutting speeds up to 600 f.p.m. on ordinary work. They also run from 10 to 100 times as long between regrindings.

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"The Tool Holder People"

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## Miscellaneous Prices—

(Effective Sept. 15, 1953)

### BOLTS, NUTS, RIVETS, SCREWS

#### Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

#### Nuts, Hot Pressed, Cold Punched—Sq.

	Pct Off List		
	Less Keg Reg. K.	Less Keg Hvy. K.	
1/2 in. & smaller	+2	15	+3
9/16 in. & 5/8 in.	+7	11	+33
3/4 in. to 1 1/2 in.			+10
inclusive	+8	10	+27
1 in. & larger	+9	9	+27
9/16 to 3/4 in.			+4
3/4 to 1 1/2 in.			

#### Nuts, Hot Pressed—Hexagon

1/2 in. & smaller	11	26	8	23
9/16 in. & 5/8 in.	2	18	+20	net
3/4 in. to 1 1/2 in.				
inclusive	+6	12	+25	+4
1 in. & larger	+8	10	+25	+4

#### Nuts, Cold Punched—Hexagon

1/2 in. & smaller	11	26	8	23
9/16 in. & 5/8 in.	9	24	+2	15
3/4 in. to 1 1/2 in.				
inclusive	+1	16	+9	9
1 in. & larger	+16	3	+20	net

#### Nuts, Semi-Finished—Hexagon

1/2 in. & smaller	23	36	14	28
9/16 in. & 5/8 in.	18	32	4	20
3/4 in. to 1 1/2 in.				
inclusive	8	23	+8	10
1 in. & larger	+14	5	+20	net

#### Light

7/16 in. & smaller	33	43		
1/2 in. thru 3/4 in.	26	37		
3/4 in. to 1 1/2 in.				
inclusive	18	30		

#### Stove Bolts

Pct Off List

Packaged, steel, plain finished	44 1/2	—10
Packaged, plain finish	25 1/2	—10
Bulk, plain finish	59	

\*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

\*\*Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

#### Rivets

Base per 100 lb

1/2 in. & larger	\$8.90
7/16 in. and smaller	\$8.00

#### Cap and Set Screws

(In bulk)

Pct Off List

Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 3/4 in. x 6 in., SAE 1020, bright	40
3/4 in. thru 1 in. up to & including 6 in.	36
1/2 in. thru 3/4 in. x 6 in. & shorter	41
high C double heat treat	33
3/4 in. thru 1 in. up to & including 6 in.	17
Milled studs	12
Flat head cap screws, listed sizes	12
Fillister head cap, listed sizes	7
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	27

#### Machine and Carriage Bolts

Pct Off List

	Less Case	C.
1/2 in. & smaller x 6 in. & shorter	4	30
9/16 in. & 5/8 in. x 6 in. & shorter	5	21
3/4 in. & larger x 6 in. & shorter	3	19
All diam. longer than 6 in.	+4	13
Lag, all diam. x 6 in. & shorter	12	27
Lag, all diam. longer than 6 in.	8	33
Plow bolts	30	

## Miscellaneous Prices

(Effective Sept. 15, 1953)

### REFRACTORIES

Fire Clay Brick	Carloads, per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00) ..	\$109.00
No. 1 Ohio ..	102.00
Sec. quality, Pa., Md., Ky., Mo., Ill. ..	93.00
No. 2 Ohio ..	102.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50) ..	16.00

Silica Brick	
Mt. Union, Pa., Ensley, Ala. ....	\$115.00
Childs, Hays, Pa. ....	120.00
Chicago District ..	125.00
Western Utah ..	131.00
California ..	138.00
Super Duty, Hays, Pa., Athens, Tex., Curtner, Calif., Windham ..	150.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) ..	19.00
Silica cement, net ton, bulk, Hays, Pa. ....	21.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala. ....	20.00
Silica cement, net ton, bulk, Utah and Calif. ....	28.50

Chrome Brick	Per net ton
Standard chemically bonded Balt. ..	\$86.00
Standard chemically bonded, Curtner, Calif. ....	96.25
Burned, Balt. ....	80.00

Magnesite Brick	
Standard Baltimore ..	\$109.00
Chemically bonded, Baltimore ..	97.50

Grain Magnesite	St. %-in. grains
Domestic, f.o.b. Baltimore in bulk fines removed ..	\$64.40
Domestic, f.o.b. Chewelah, Wash., in bulk ..	38.00
in sacks ..	43.75

Dead Burned Dolomite	Per net ton
F.o.b., bulk, producing points in: Pa., W. Va., Ohio ..	\$13.75
Midwest ..	13.85
Missouri Valley ..	13.65
Narbo, Bettsville, Ohio ..	14.50

### FLUORSPAR

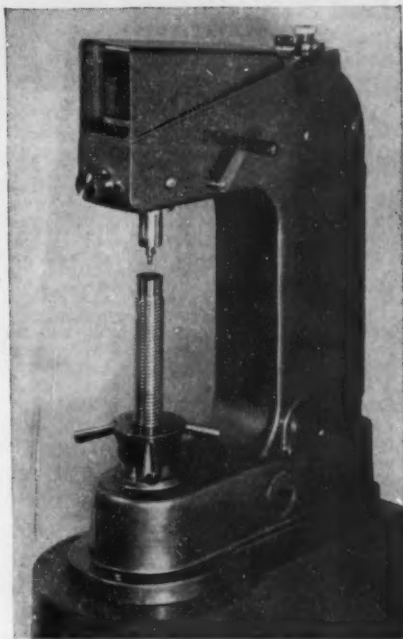
Washed gravel, f.o.b. Rosiclare, Ill. Price, net ton; Effective CaF <sub>2</sub> content	
72% or more ..	\$44.00
70% or more ..	42.50
60% or less ..	38.00

### METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.	
Swedish sponge iron, c.l.f. New York, ocean bags, ..	11.25¢
Canadian sponge iron, del's. in East ..	12.0¢
Domestic sponge iron, 98+ % Fe, carload lots ..	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+ % Fe ..	44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+ % Fe ..	60.0¢
Hydrogen reduced iron, minus 300 mesh, 98+ % Fe ..	53.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+ % Fe ..	83.0¢ to \$1.48
Aluminum ..	31.5¢
Brass, 10 ton lots ..	30.00¢ to 33.25¢
Copper, electrolytic ..	43.50¢
Copper, reduced ..	43.50¢
Cadmium, 100-199 lb., 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quantity, del'd. ..	\$3.50
Lead ..	21.75¢
Manganese ..	57.0¢
Molybdenum, 99% ..	\$2.75
Nickel, unannealed ..	88.0¢
Nickel, annealed ..	95.0¢
Nickel, spherical, unannealed ..	92.0¢
Silicon ..	33.5¢
Solder powder, 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302 ..	\$3.9¢
Stainless steel, 316 ..	\$1.10
Tin ..	14.04¢ plus metal value
Tungsten, 99% (65 mesh) ..	\$5.35
Zinc, 10 ton lots ..	23.0¢ to 30.5¢

## SPEEDS AND SIMPLIFIES HARDNESS TESTS

New, Low-Cost Standard and Superficial Testers Offer Magnified Optical Readings; Automatic Load Changing



Here they are—the first hardness testers to provide magnified optical readings. Only the new Galileo Hardness Testers project their measurements on a screen, with ball and diamond Rockwell scales easily visible at high magnifications; Brinell numbers easily obtained through readings on the screen. And only Galileo enables you to change loads quickly and automatically by simply turning a dial. All loads are obtained by exact, precision-made weights, insuring absolute constancy in calibration.

Exceptionally rugged and sensitive, the instruments are enclosed in dust-proof, grease-proof metal cases for trouble-free operation. Designed for Rockwell measurements on any type of metal within the range of 30 to 1000 Brinell units. They can also be used for Brinell tests, special loads and for Vickers measurements. Built-in oil damper with external control enables operator to regulate speed with which load is applied. The Standard Tester provides loads of 31.2—60—62.5—100—150—187.5—kgm; the Superficial Tester provides loads starting at 5 kgm. Diamond cone and steel ball penetrators. Maximum throat opening 7½". Wide range of accessories. Reasonably priced.

For details on the Hardness Testers and other Galileo instruments of modern functional design, write to the address below—Dept. A.

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### AIR BLAST VALVES

Eject parts at each stroke of Press.  
PRICE

**\$29.00**



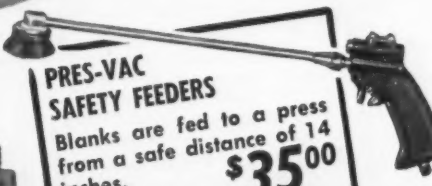
Prices F.O.B. Plant

It pays to keep fingers out of presses!

### PRES-VAC SAFETY FEEDERS

Blanks are fed to a press from a safe distance of 14 inches.  
PRICE . . . . .

**\$35.00**

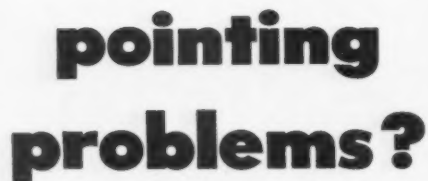


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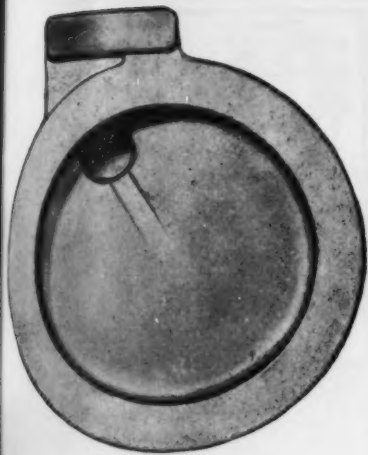




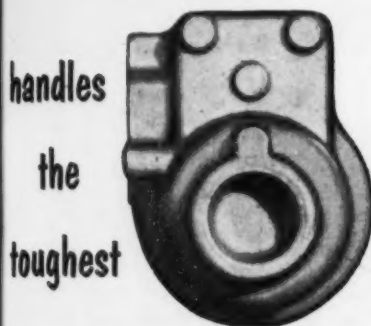


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Swager Department  
555 Field Street • Torrington, Conn.  
Makers of  
**TORRINGTON NEEDLE BEARINGS**

## A black and white photograph showing a person's hand holding a welding torch. The torch is positioned over a metal surface, and a bright, intense flame or weld is visible at the point of contact. The background is dark and indistinct.



... because  
**WILLIAMS**



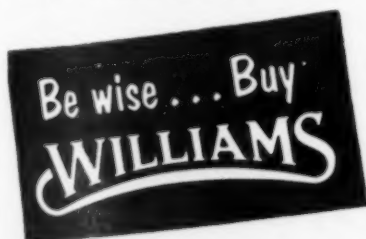
handles  
the  
toughest

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Even more important to many of our customers is the skilled experience which enables Williams to engineer and forge the toughest jobs to a high degree of accuracy.

Why worry about drop forgings when it is so easy to consult with a specialist in the field for over half a century.



**J. H. WILLIAMS & CO.**

575 Vulcan Street

Buffalo 7, N. Y.

## Ferroalloy Prices—

(Effective Sept. 15, 1953)

### Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.		
Manganese	Silicon	
16 to 19%	3% max.	\$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

### Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed	36.95
Ton lots	38.45

### Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	31.50
Ton lots	33.50
Less ton lots	35.50
Premium for hydrogen-removed metal	1.50

### Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.			
	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	30.00	31.85	33.05
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

### Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn	21.35¢
--	--------

### Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.	
Carload bulk	11.40
Ton lots	13.05
Briquet contract basis carlots, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

### Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$95.50 gross ton, freight allowed to normal trade area.	
Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00. Add \$1.00 per ton for each additional 0.50% Si up to and including 17%. Add \$1.45 for each 0.50% Mn over 1%.	

### Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
95% Si, 2% Fe	18.00
97% Si, 1% Fe	18.50

### Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.	
Carloads, bulk	8.95
Ton lots	8.55

### Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.			
25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
65% Si	12.60	90.95% Si	17.00

### Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.			
	Cast	Turnings	Distilled
Ton lots	\$2.05	\$2.95	\$3.75
Less ton lots	2.40	3.30	4.55

### Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.	
Openhearth	\$3.00-\$3.10
Crucible	3.10-3.20
High speed steel (Primor)	3.20-3.35

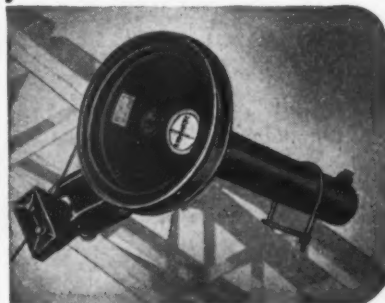
**2** ways  
to make  
crane  
operations  
pay more



### Rud-O-Matic Magnet Reel Tagline Combination

Steel tagline holds magnet steady and absorbs the load... protective slack is maintained in expensive magnet cable to avoid jerking, pulling loose at the terminals or snagging.

Standard with major crane manufacturers, made in five sizes for your present equipment.



### Rud-O-Matic Tagline

steadies your clamshell buckets. Provides ample coil spring power at all boom angles to keep bucket lined up with the work. Makes more loads per day easier. Rud-O-Matics are fool-proof, trouble-free. Eight sizes meet all requirements. Available immediately. For full information see your dealer—or mail coupon below.

I'd like more information on ☐ Rud-O-Matic Taglines, ☐ Rud-O-Matic Magnet Reel-Tagline Combinations. Send literature and complete details.

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Company

Address

City  Zone  State

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**Tagline**

CORPORATION

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for  
**BRIGHTER  
CLEANER  
METALS**  
add  
**NOPCO\* 1067-A**

NOPCO 1067-A is an unusual liquid surface tension depressant designed for mineral acid solutions. Since it affords deeper and more uniform penetration of oxide scale, its use results in a much brighter and cleaner surface and elimination of pitting.

Wherever pickling takes place—plating, wire manufacturing, galvanizing—or in sulfuric acid anodizing, metal processors are finding that Nopco 1067-A offers many distinct advantages:

1. Enables the acid solution to penetrate oxide scale quickly and evenly, leaving the metal surface clean and smooth.
2. Lowers operation time and labor costs. Better drain-off means fewer rinsings for complete acid removal.
3. Cuts sulfuric acid costs by lowering carry-over of acid solution to rinse tank.
4. Reduces acid contamination in operations following pickling.
5. Eases acid disposal problem by localizing acid in first tanks.
6. Prevents formation of large gas bubbles and excessive spraying in anodizing.
7. Reduces fuming in pickling and anodizing.

Mail the coupon today.

**NOPCO CHEMICAL COMPANY**  
Harrison, New Jersey

Gentlemen:  
Please send me full information about Nopco 1067-A for use in pickling.

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**NOPCO**  
CHEMICAL COMPANY  
HARRISON, NEW JERSEY

Boston • Chicago • Cedartown, Ga. • Richmond, Cal.

## Ferroalloy Prices

(Effective Sept. 15, 1953)

Alsilfer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carloads	9.90
Ton lots	11.30
Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo	\$1.15
Ferrocolumbium, 50-60% 2 in. x D contract basis, delivered per pound contained Cb.	
Ton lots	\$6.40
Less ton lots	6.45
Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	\$4.75
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo	\$1.32
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	\$75.00
Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.35
Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.50
Less ton lots	1.55
Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton	\$177.00
Ferrotungsten, 1/4 x down, packed, per pound contained W, ton lots, f.o.b.	\$4.45
Molybde oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	\$1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.12
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢
Vanadium Pentoxide, 86-89% V <sub>2</sub> O <sub>5</sub> contract basis, per pound contained V <sub>2</sub> O <sub>5</sub>	\$1.28
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	\$1.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	8.00¢
<b>Boron Agents</b>	
Borostil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B	\$5.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Corbortam, Ti 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00¢
Ferroboration, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	\$1.20
F.o.b. Wash. Pa.; 100 lb up	
10 to 14% B	.85
14 to 10% B	1.20
19% min. B	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	\$1.00
No. 6	65¢
No. 79	50¢
Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd	
Ton lots	\$1.46
Less ton lots	1.57
Nickel - Boron, 15-18%, B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered	
Less ton lots	\$2.05
Silcaz, contract basis, delivered.	
Ton lots	45.00¢



**ENDS  
PRODUCTION  
JAMS ... fast!**

Production hold-ups are costly. Install the "Series 700" 'Load Lifter' Electric Hoist and fast efficient load-handling is yours around the clock. That's how countless plants boost defense and civilian output economically.

The 'Load Lifter' lifts a 1000-lb load one foot per second — at the push of a button. One hand is always free to guide the load. No muscle strain. Smooth, effortless lifting keeps workers at peak efficiency.

Steel suspension, powerful load and motor brakes, over-capacity load hook, and only 24 volts at the push button make the rugged 'Load Lifter' completely safe for heavy-duty lifting. Heat-treated helical gears and ball bearings throughout assure long service life. Capacities range from 1000 lbs. up. Single and two-speed control available. Get full details. Write for Bulletin 399.



**'Load Lifter'**  
ELECTRIC HOISTS

**MANNING, MAXWELL & MOORE, INC.**  
MUSKEGON, MICHIGAN

Builders of "Shaw-Box" and "Load Lifter" Cranes, "Budgit" and "Load Lifter" Hoists and other lifting specialties. Makers of "Ashcroft" Gauges, "Hancock" Valves, "Consolidated" Safety and Relief Valves, and American Industrial Instruments.



# NO GEARS-NO CHAINS

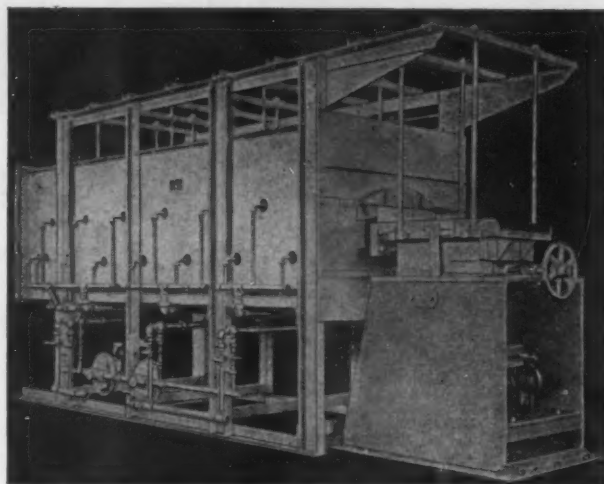
**NO TROUBLESOME WORKING PARTS**  
to be affected by interior heat

## IN OPERATION—

The full muffle swings from the super-structure and an automatic mechanical movement at the end of each stroke advances the work.

## CLEAN HARDENING—

Tools, springs, chain parts, pins, screws, balls, nuts, stampings, ball-races, pen-points and instrument parts are some of the items economically, efficiently and dependably hardened in these furnaces.



The AGF RECIPROCATING FURNACE Model No. 191, Full Muffle, Continuous.

This controlled Atmosphere Furnace is widely popular. It comes in five sizes ranging in capacity from 10 to 1200 lbs. per hour.

Write for full information and price, indicating the products you wish to heat treat and production required.

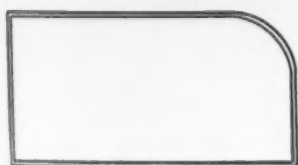


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# ARC WELDED STEEL TUBING

*Odd shapes!*

*Short runs!*



SHAPED TUBING - - - 4" x 8" MAXIMUM

ROUND TUBING - - - 2" DIAMETER & LARGER

Wall thickness 14 gauge through 1/4"  
Tapered sections available in 10' lengths

*Let us bid your requirements*

**HARRISON SHEET STEEL CO.**

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September 17, 1953

good machinery

**REBUILT**

to exacting standards

27" x 12' centers LODGE & SHIPLEY Selective Geared Head Lathe, AC-MD  
28" x 15' centers BERTRAM (Niles patterns) Timesaver Engine Lathe, 2 carriages, rapid traverse, AC-MD, 1943  
36" x 12' centers AMERICAN Heavy Duty 16 Speed Geared Head Lathe, AC-MD  
42" x 9 1/2" centers NILES Timesaver Heavy Duty Lathe, 42" swing over ways, rapid traverse, anti-friction head, AC-MD  
60" x 20' NILES BEMENT POND Geared Head Engine Lathe, rapid traverse  
16" x 78" centers PRATT & WHITNEY Toolroom Lathe, taper attachment, collets, chucks, new 1943  
No. 3 WARNER & SWASEY Electro-Cycle Turret Lathe, new 1949  
No. 5 GISHOLT Ram Type Turret Lathe, preselector head, new 1943  
No. 1L GISHOLT Turret Lathe, bar feed, tooling, new 1943  
42" BULLARD Spiral Drive Vertical Turret Lathe, extra high column, AC-MD  
62" BULLARD Maxi-Mill Vertical Boring Mill, 2 swivel rail heads, power rapid traverse, AC-MD  
No. 2 CINCINNATI Vertical Mill, dial type, new 1945  
No. 3 ROCKFORD Combination Vertical & Horizontal Mill, 10 HP, AC-MD  
No. 3-24 CINCINNATI Plain Hydromatic Mill, AC-MD  
No. 4 KEARNEY & TRECKER Plain Horizontal Mill, No. 50 taper, motor in base, rapid traverse  
No. 4 CINCINNATI High Speed Dial Type Plain Horizontal Mill, new 1943  
No. 4H KEARNEY & TRECKER Vertical Mill, new 1944  
14" x 48" MATTISON Hydraulic Surface Grinder, magnetic chuck, AC motors, 1940  
25A HEALD Rotary Surface Grinder, 24" diameter magnetic chuck, AC-MD  
1 1/2" LANDIS Bolt Threader, leadscrews, AC-MD  
75 Ton HENRY & WRIGHT Double Crank Dieing Machine, rail feed & scrap cutter  
600 Ton CHAMBERSBURG Wheel Press, cast steel frame, inclined, AC-MD  
30" MORTON, Hydraulic Keyseater, new 1942  
48" x 48" x 12' NILES Double Housing Planer, 2 rail heads, 1 side head, power rapid traverse  
48" widened to 69" x 12' DETRICK & HARVEY Double Housing Planer, box table, DC reversing motor drive

**O'Connell**  
MACHINERY CO.  
of BUFFALO, n. y.  
1693 GENESEE ST.

## The Clearing House

**NEWS OF USED AND REBUILT MACHINERY**

**Profits Slump . . .** As might be expected, higher labor and material costs took their toll of profits in the electrical equipment repair and rebuilding industry. For at least a segment of the industry 1952 net profits were 13.9 pct less than in 1951 and inflation was an important factor in this decline.

National Industrial Service Assn. in its recent annual survey of the industry's earnings, found that net income before federal income taxes of 123 of its members averaged 9.3 pct of sales in 1952 as compared with 1951's postwar high of 10.8 pct.

Responses to the survey were almost equally divided between incorporated firms and partnerships or other unincorporated businesses. Corporation net income before federal income taxes averaged 5 pct of sales as compared with 6.3 pct in 1951. Net income for partnerships and proprietorships before federal income taxes and withdrawals for compensation to owners dipped from a 1951 level of 22.4 pct to 21 pct.

**What They Earned . . .** In reporting its findings, NISA's Sales Survey Committee, headed by Howard A. Lilly, Tampa Armature Works, Tampa, Fla., also listed net profits for the industry from 1946 through 1952. Figures show that the 1952 profit level of 9.3 pct was slightly higher than the postwar average of 8.8 pct:

1946.....	8.2 pct
1947.....	10.5 pct
1948.....	10.4 pct
1949.....	4.3 pct
1950.....	7.9 pct
1951.....	10.8 pct
1952.....	9.3 pct
Average	8.8 pct

**Losing Market . . .** That one man's success can be another's downfall is the moral Seattle used machinery dealers are currently learning, as success of industrial firms in Alaska is closing up this

area as a market for Seattle used machinery suppliers.

At the end of World War II many new company's started operations in Alaska. Since they were short on capital, they were natural customers for the used machinery trade. Now, however, since they are enjoying a fair degree of success, many of these firms have enough money to buy new machinery and it appears that is what they want.

**Machinery Is Scarce . . .** One of Seattle's used machinery dealers has all but been forced out of the business by the scarcity of small equipment. Since it does not have sufficient floor space to stock large machinery and is unable to obtain the small equipment that it has been carrying during the last 15 years, the firm is finding itself in a tight squeeze.

Three of the Pacific Northwest's major used machinery firms believe the market will continue to sag until the buyer is given a better break on prices.

As one dealer pointed out, "There isn't enough difference between the price of good used equipment and new equipment to make it worthwhile for the buyer. We used to be able to give them a break on quick delivery, but now it's possible to get new machinery within 3 to 4 months."

**Plan Liquidation Policy . . .** Next board meeting of the Machinery Dealers National Assn., scheduled to be held in New York Sept. 28th, should produce some important results as one of the major problems to be discussed is the problem of liquidation of government-owned machine tools (THE IRON AGE, Sept. 10, 1953, p. 246). It is expected that MDNA policy on this problem will be decided at that time.

Other important matters to be considered at the board meeting are depreciation of machine tools and methods of aiding members with renegotiation problems.